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TRIAL OF WHOOPING-COUGH VACCINE IN CITY AND RESIDENTIAL NURSERY GROUPS

A REPORT TO THE MEDICAL RESEARCH COUNCIL

BY

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During the years 1942 to 1944 an attempt was made to assess the prophylactic value of a pertussis vaccine by comparing the fate of inoculated children with that of control children. In Oxford City the trial was run in conjunction with the Public Health Department; it comprised 327 inoculated and 305 control children, who were followed up for over a year after their last inoculation. During this time only sporadic cases of whooping-cough occurred. From Nov., 1942, onwards small but similar groups of inoculated and control children were observed in eight residential nurseries for evacuees. In four of these nurseries (Nos. 1, 2, 5, and 8) an epidemic of whooping-cough occurred some time after the inoculations were completed, enabling the experience of the two groups to be compared. The outbreak at one of these nurseries (No. 1) has already been reported (McFarlan and Topley, 1943), but for the sake of completeness it is included with three other outbreaks at Nurseries 2, 5, and 8, to be described now. The present report summarizes the evidence obtained using a total (English) dosage of 40,000 million organisms in Oxford City and two residential nurseries (Nos. 1 and 2), and a higher dosage at two other residential nurseries (Nos. 5 and 8). The investigation was carried out under the direction of the Whooping-cough Subcommittee of the Infectious Diseases Committee of the Medical Research Council.

The vaccine was prepared by Messrs. Burroughs Wellcome and Co. For the vaccine used in Oxford City and residential Nurseries 1 and 2 a mixture of three strains of *H. pertussis* in Phase I was employed, each of which had been grown for 3 days at 37° C. on a Bordet-Gengou medium containing 33% of horse blood. The growth was suspended in 0.5% phenolized distilled water, the function of the water being to lyse the horse-blood corpuscles in the vaccine. The suspension was filtered through muslin and allowed to stand for 7 days at 4° C. The haemolysed supernatant fluid was then discarded and the deposit washed once in 0.5% phenolized saline. The vaccine was suspended finally in 0.5% phenolized saline and standardized by Brown's opacity tubes to a calculated strength of 20,000 million organisms per ml. No heat was applied to the vaccine at any stage of the preparation; the organisms were both killed and preserved with 0.5% phenol. In the vaccine used at residential Nurseries 5 and 8 the organisms were killed and preserved with 1:10,000 merthiolate; in all other respects the preparation of the vaccine was the same as for the earlier batches.

It is important to point out that the methods used for the standardization of vaccines in this country and the United States yield grossly discrepant results. The reason for this need not be discussed here. It is sufficient to draw attention to the difference, which is clearly of importance in assessing the results of comparative trials in the two countries. Observations made at the Wellcome Physiological Research Laboratories (for an account of which we are indebted to Dr. H. J. Parish) showed that the Wellcome vaccine, stated on the label to contain a given number of organisms, was about four times as turbid as that of a Parke Davis vaccine from Detroit having the same labelled strength. Prof. G. S. Wilson (personal communication), who, in this laboratory, compared a number of batches of the Wellcome vaccine with batches of the Parke Davis vaccine, using both turbidity estimations and direct enumeration of the organisms in a Helber chamber under dark-ground illumination, found that by both methods the Wellcome vaccine was over three times as strong as the Parke Davis vaccine.

TABLE I.—*Methods of Inoculation and Time Relation to Whooping-cough Cases*

Place of Trial	Method of Killing and Preserving the Vaccine	Volume given at Inoculation (Inoculation Number)				Time Interval between Inoculations	Total Dosage in Millions of Organisms*	Date of Last Inoculation	Time of Onset of First and Last Cases of Pertussis	Time Interval: Last Inoculation to Onset of First Case in Epidemic
		1	2	3	4					
Oxford	Phenol	1 ml.	1 ml.	0	0	4 weeks	40,000	Jan.–March, 1943	Cases observed Mar., 1943, to July, 1944	No epidemic
Nursery 1	,,	1 ml.	1 ml.	0	0	,,	40,000	Dec. 21, 1942	April 4, 1943, to end of May	4 months
,, 2	,,	1 m..	1 ml.	0	0	,,	40,000	Jan. 1, 1943	Oct. 16, 1943, to end of Nov.	9 ,,
,, 5	Merthiolate	1 ml.	1 ml.	1 ml.	2 ml.	1 week between 1st, 2nd, and 3rd; 4 weeks between 3rd and 4th	100,000	Dec. 30, 1943	April 22, 1944, to middle of July	4 ,,
,, 8	,,	0·5 ml.	0·75 ml.	1 ml.	0·75 ml.		60,000	March 15, 1944	March 28, 1944, to June 6	2 weeks

* As pointed out in the text, the figures given in this column would have been about three times as large if the vaccine had been standardized in the United States.

The vaccine was injected intramuscularly into one or other arm. If A.P.T. was given at the same time it was injected at another site. The volumes inoculated and the time intervals between the inoculations are shown in Table I. The

total dosage of about 40,000 to 100,000 million organisms would probably correspond to an American dosage of about 120,000 to 300,000 million.

Although the time interval between the last inoculation and the first exposure of the children to whooping-cough ranged from 2 weeks to 9 months, and although in Oxford City 1 to 6 children in the investigation developed whooping-cough every month up to 18 months after the last inoculation, the number of cases was too small to justify any attempt at correlation between this interval and the incidence of whooping-cough among the two groups. It was not possible to obtain sera from the children for either complement-fixation or agglutination tests.

Reactions to the Pertussis Vaccine.—No severe reactions occurred in the children in Oxford City and residential Nurseries 1, 2, 3, and 4, where a total dosage of 40,000 million organisms was given. It was found impracticable in Oxford itself to get reliable information from the homes, but at each nursery a careful record was kept. At Nursery 1, for example, 10 out of the 12 children inoculated were reported to have had local reactions after their first but not after their second inoculation; only one was at all marked. There were no general reactions. On the other hand, the experience at Nurseries 5, 6, and 7, where another batch of vaccine was given in a total dosage of 100,000 million organisms, was disturbing. The general reactions were so severe as to condemn the further use of the vaccine in this dosage. Each of the 17 children inoculated developed a febrile reaction after the first inoculation. In two children the highest temperature recorded was 104° F. and 104.8° F. respectively, and the pyrexia lasted 7 to 10 days. The remaining children had temperatures of 99.4 to 101° F., which returned to normal in from 1 to 3 days. Pyrexial reactions (99 to 102° F.) followed each subsequent inoculation in all but one of the 14 children who received the full course. At the site of the inoculation the area of redness never exceeded 3 in. in diameter, and was generally less than this; but the local reactions did appear to disturb the children. For this reason when Nursery 8 was visited the dosage of vaccine inoculated was reduced to 60,000 millions; the reactions, however, both general and local, were enough to make the widespread use of this dosage undesirable.

The methods of selection of the inoculated and control groups, the evidence of their similarity, and the experiences of these groups are perhaps best described separately for Oxford City and for the residential nurseries.

The Oxford City Trial

The two series of children were chosen from those who were more than 6 months and less than 3 years of age on Jan. 1, 1943, who normally attended the infant welfare clinics or wartime day nurseries of the Public Health Department, and who had no history of whooping-cough or of inoculation against it. The majority of children had their consent forms signed and the first inoculation given at the same time as a normal visit to the clinic, and often at the same session as an A.P.T. inoculation against diphtheria. The propaganda was carried out not only at the clinics but also by the health visitors, who during their routine home visits persuaded the mothers to bring their children up to the clinics for whooping-cough inoculations. It therefore needed very little effort on the mother's part to have her child inoculated. The control children were chosen from the clinic record cards, which at each clinic were filed in order of the date of first attendance. For every child inoculated, a card was picked at random from the cluster of cards about the same place in the file as that of the inoculated child. The first card picked of a child of the same sex, approximately the same age, and with no history of whooping-cough or inoculation against it, was marked "Whooping-cough Investigation" and the child's name was included in the control group. The inclusion of a child in this group was not determined in any way by the circumstance that its mother had refused permission for inoculation.

The children attending wartime day nurseries were chosen separately. Those eligible in each nursery were divided according to age and sex into inoculated and control groups, using the same methods as described for the residential nurseries. When a child left Oxford or was inoculated against whooping-cough by a general practitioner it was excluded from the investigation. At the end of the period of observation there were 305 control and 327 inoculated children in the series. The nursery population had altered greatly.

Evidence of Similarity.—Some of the characteristics that might affect the incidence of whooping-cough were recorded in the two groups. χ^2 and χ_c tests (Fisher and Yates, 1943) were applied to the data to determine how far the differences in incidence might be considered to be the result of sampling variation. The differences in distribution of (1) number of children in family, (2) number of other susceptible children in family, (3) number attending day nurseries or nursery classes, (4) number suffering from measles before or during the investigation, were in no instance greater than could be accounted for readily by sampling variation. However, the frequency of prior inoculation with A.P.T. was significantly less ($P < 0.005$) in the control group than in the inoculated group (49% in the control group and 73% in the inoculated group had at the beginning of the experiment a history of A.P.T. inoculation). Fifty-one per cent. of the children in the control group and 89% of the children in the inoculated group, who had not received A.P.T. at the beginning, received it in the course of the investigation. Thus the frequency with which inoculated children were brought for A.P.T. remained consistently higher than that in the control group.

Since this difference between the two groups might have a bearing, as an index of maternal care, on the incidence of exposure to pertussis, the effect on pertussis incidence has been carefully investigated. There is a difficulty, in that all but 6 of the 89 inoculated children who had not received A.P.T. at the start of the investigation had received it at the end. In the control group 154 (50%) had not received A.P.T. at the beginning of the investigation, and 76 (25%) had still not received it at the end. Thus it is unlikely that any A.P.T. effect could be established in the inoculated group, and, in fact, the differences in incidence are well within sampling variation. In the control group, in which an A.P.T. effect might have been observed, there is an even smaller difference in relative frequency of the incidence of pertussis. No evidence was obtained that the A.P.T. distribution was relevant to the experiment.

So far as it is possible to judge, it appears that the two series of inoculated and control children were fair random samples of the susceptible Oxford clinic children between 6 months and 3 years of age.

Follow-up Observations.—These children were observed for 12 to 18 months, starting Jan. to March, 1943, and ending March to July, 1944. Observation of the inoculated children was begun 3 to 28 days after their last inoculation. The control children were selected and visited during the inoculation period, and their beginning of observation was made to correspond with that of the inoculated children. The date of the last observation was the date of the last visit to the home. A chart was compiled to show the number of inoculated and control children, and the number of cases of whooping-cough among them, for every month from Jan., 1943, to July, 1944. In no month was there any significant difference in the proportion of inoculated and control children. It follows that the average length of observation per child was the same in the two groups. Owing to shortage of staff it proved impossible to pay regular visits to the home of each vaccinated and control child in the series. Cases or contacts were visited by one of us (A. M. M. and later E. T.) as soon as possible after they were notified to the Public Health Department by the medical practitioners or by the health visitors. The notifications were necessarily often made late in the disease or even weeks later. In only 28 instances was it considered worth while taking a nasopharyngeal swab from a child in the investigation or from a member of its family who had definite whooping-cough. In only six of these cases was *H. pertussis* isolated. During the spring of 1944 each health visitor reviewed the history of every child on her list who was in the investigation, and in the majority of instances made the final visit herself. However, if there was a history of a suspicious cough or of whooping-cough or of contact with whooping-cough, or a special visit was required for further information, one of us made the final visit. In May, 1944, a list was compiled of every school or nursery that was attended by a child in the investigation and from which one or more cases of whooping-cough had been notified to the

Public Health Department. Each of these was visited once, and the teacher or matron told us which children in the investigation had been in the same class or room as a case of whooping-cough, and whether they had developed pertussis. In a few cases notified for the first time a home visit was made.

The evidence obtained by this method of follow-up is summarized in Tables II and III.

TABLE II.—*Incidence of Whooping-cough among Children exposed to a Case in the Same Room of a Day Nursery or Nursery Class in Oxford City*

	Inoculated Children	Control Children
Number of children exposed	29	25
Number of children developing definite whooping-cough after exposure	5	6
Proportion developing definite whooping-cough after exposure	17%	24%

Statistical analysis of these data shows that there are between 5 and 7 chances out of 10 of obtaining greater differences in the observed frequency of whooping-cough in two similar samples drawn from such a uniform population.

Evidence of Exposure to Whooping-cough.—The monthly record of cases showed no evidence of an epidemic during the investigation. A history of exposure to whooping-cough was obtained more frequently from the mothers of inoculated children than of control children. Thus it appeared from the home-visit data that 27 inoculated and 20 control children had been exposed to whooping-cough in the same house for more than one day. A history of less intimate exposure was obtained from the parents of 36 inoculated and only 14 control children. In the nursery classes of schools and in day nurseries (Table II) there was no significant difference in the frequency of exposure. The evidence from mothers whose children had been inoculated might well be more reliable than that of the mothers of the control children, who did not understand their connexion with the investigation. In the nursery classes and nurseries the same teacher or matron observed a large number of children. The teacher generally knew nothing of the difference between inoculated and control children, whereas the matrons had assisted in the original planning of the experiment and understood clearly the importance of treating them alike. For this reason we should be disposed to pay considerably more attention to the data obtained from the nurseries and schools than from the mothers.

TABLE III.—*Incidence of Whooping-cough, Regardless of History of Exposure, Among All Children in the Investigation*

	Oxford City		Residential Nurseries	
	Inoculated Children	Control Children	Inoculated Children	Control Children
Number of children observed	327	305	33	30
Number of cases of definite whooping-cough	41 (30)*	43 (29)*	18 (15)*	19 (19)*
Number of cases of doubtful whooping-cough	10	6	5	3
Proportion of children with definite whooping-cough	12·5%	14·1%	54·6%	63·3%

* The figures in brackets represent the numbers of definite cases of whooping-cough which both whooped and vomited.

Statistical analysis shows that the probabilities of obtaining more widely different frequencies in two samples from the same population are 0.5–0.7 for the Oxford City samples and 0.3–0.5 for the residential nursery samples.

Evidence of Incidence of Whooping-cough.—This evidence is clinical, not bacteriological. Its only claim to uniformity is that the diagnosis was decided by home visits made by the same person, who used the same method of approach to inoculated and control children. The original notifications were, as stated above, made by general practitioners and health visitors. Each health visitor had approximately equal numbers of inoculated and control children on her lists, and appreciated the importance of treating them alike. It can be seen from Table III that the frequency of clinically definite cases of whooping-cough was similar in the inoculated and control groups of children. It is more difficult to assess accurately the incidence of whooping-cough among children with a history of exposure to the disease. We have reason (see above) to doubt whether the mothers of inoculated children gave reports comparable with those from mothers of the controls. For this reason Table II presents the evidence for the incidence of cases among children exposed in nursery classes or day nurseries only. The differences in incidence of whooping-cough—first, between all the inoculated and all the control children, and, secondly, between the small numbers of inoculated and control children known to be exposed to whooping-cough in day nurseries or nursery classes—can be accounted for entirely on the basis of sampling variation.

Although in each case a note was made of the maximum number of whoops per day and the presence or absence of vomiting, the results depended on the, often distant, memory of a wide variety of mothers and cannot be regarded as reliable. Most cases were mild. Only four were complicated by pneumonia—two in inoculated and two in control children.

The Residential Nurseries

The methods of selecting the inoculated and the control groups, the evidence for their similarity, and the experience of these groups will be discussed for all four nurseries together. These nurseries, all in the home counties, are housed in mansions used temporarily for the care of evacuee children. Each is an isolated community cared for by a residential staff, sometimes aided by daily helpers.

In each nursery every child from 6 months to 3 years of age who had no history of whooping-cough or of inoculation against it was included in the trial. At Nurseries 5 and 8 the upper age limit was raised to 4 years in an attempt to get larger groups of children. The eligible children were divided into two groups of almost equal age and sex distribution. In Nurseries 5 and 8 it also proved necessary to ensure an even distribution of the two groups in the same room or unit—in Nursery 5 because of a suspected case of whooping-cough at the time of the first inoculation, and in Nursery 8 because of the greater degree of segregation. If the mother of a child selected for inoculation refused to give her consent the child was placed in the control group and a corresponding "control" child selected for inoculation instead. In each residential nursery the two groups of children were similar in every respect except inoculation. For months or years they were cared for and fed by the same staff and exposed to the same risks of infection.

When whooping-cough was reported in a residential nursery it was visited at once, and thereafter at weekly to monthly intervals throughout the epidemic.

The evidence of equal and definite exposure to whooping-cough was very much more reliable than is possible among children living at home. In each outbreak *H. pertussis* was isolated from at least one child with clinical whooping-cough. At every visit the matron told us of the dates that any child had been moved from one room to another. It was clear that in each of the four nurseries all the selected children had been exposed to a whooping-cough case that had lived and slept in the same room while in the catarrhal and paroxysmal stages of the disease.

The evidence for the occurrence of whooping-cough was also more reliable than is possible among children living at home. The children were observed throughout by the same staff and by the matron, who, each time we visited the nursery, gave us the clinical details which she had collected for all the children in the investigation. The findings are summarized in Table III. The cases were nearly all mild. Two cases in Nursery 8 and one case in Nursery 2 were considered more severe by the matrons. These were control children. The evidence obtained on the maximum number of whoops per day was necessarily less reliable and showed nothing significant. Only one child showed marked loss of weight during the illness. This was a control child who developed a dubious pneumonia. No other complications occurred.

These facts, together with the data in Table III, emphasize the smallness of the figures on which any conclusion from the nursery material must be based. All that can be said is that the difference in the incidence of whooping-cough in the inoculated and control groups can be accounted for entirely on the basis of sampling variation. No satisfactory evidence was obtained that the vaccine was of any value in modifying the course of the disease.

Discussion

The Oxford City evidence has the advantages and disadvantages of a city field trial. These have already been discussed. The results show that the pertussis vaccine in a total (English) dosage of at least 40,000 million organisms did not significantly affect the incidence of whooping-cough. In the residential nursery trials the groups were almost identical in constitution and risk of exposure to infection, and the clinical data were more reliable, but the number of children under observation was necessarily much smaller. The results, however, bear out the findings in Oxford City that the vaccine was of no value in preventing whooping-cough.

Doull and his colleagues (1939) have already recorded results almost as disappointing as our own; but the majority of the reports from the United States and Canada suggest that vaccination against pertussis is effective. Although it is possible to find faults with points in the planning or statistical analysis of some of the trials it is difficult to avoid the conclusion that vaccination conferred some protection. It is noteworthy that most of these trials were carried out in clinic populations in which it is extremely difficult to obtain perfect equalization of the inoculated and control groups, particularly in regard to exposure to infection. In one of the few trials conducted in residential institutions, where a far greater degree of similarity can be attained between the two groups, little or no success was claimed (Siegel and Goldberger, 1937).

Our own results may be criticized on the ground that the vaccine was of insufficient antigenic potency or that the dosage employed was too low. Examination of the data recorded by different observers who have apparently been successful in whooping-cough prophylaxis shows that a wide variety of vaccines has been used, and there is little to suggest that any one method of vaccine preparation is greatly superior to any other. In respect of dosage, we have already pointed out that there is a gross discrepancy between the results yielded by the methods of vaccine standardization in this country and the United States, and that if our vaccine had been prepared in an American laboratory its strength would have been estimated at about 60,000 millions instead of 20,000 millions per ml. It is probable, therefore, that our total dosage was higher than that used in any of the investigations recorded in Canada or the United States. This is borne out by the severity of the reactions that we obtained after inoculation of the larger doses of vaccine.

Since the possibility could not be excluded that the Wellcome vaccine used in our investigations differed in some material way from vaccines prepared in the United States and Canada, it was decided by the Whooping-cough Subcommittee of the Preventive Medicine Committee of the Medical Research Council to carry out a fresh investigation in which a vaccine of American origin was used. Such a trial is now being undertaken in Oxford, under carefully controlled conditions, using a vaccine manufactured by Messrs. Parke Davis of Detroit to the formula of Dr. Sauer, of Evanston, Ill. The results of this inquiry will, it is hoped, be published in due course.

Summary and Conclusions

Over 600 susceptible children of 6 months to 3 years of age attending welfare clinics and wartime day nurseries in Oxford City, and 110 evacuee children of 6 months to 3 or 4 years of age distributed in eight residential nurseries in Oxfordshire, Berkshire, and Buckinghamshire, were divided into "inoculated" and "control" groups by methods designed to render the two groups similar in every respect other than inoculation.

The inoculated children were given either two doses of pertussis vaccine at a 4-weeks interval, or four doses at intervals of 1, 1, and 4 weeks. The total dosage ranged from 40,000 to 100,000 million organisms, corresponding to an American dosage of about 120,000 to 300,000 millions.

Whooping-cough occurred sporadically in Oxford City during the succeeding 18 months, and broke out in four of the residential nurseries 2 weeks to 9 months after the last inoculation.

No significant difference was observed in the incidence or severity of whooping-cough between the inoculated and the control children. In Oxford City 12.5% of 327 inoculated and 14.1% of 305 control children developed definite whooping-cough. In the residential nurseries the corresponding figures were 55% of 33 inoculated and 63% of 30 control children.

The evidence obtained from this investigation lends no support to the view that pertussis vaccine is of value in the prophylaxis of whooping-cough; and it is suggested that the use of this vaccine should be discontinued till some positive evidence of its value is obtained in further carefully controlled trials.

We are indebted to Dr. R. B. Fisher for statistical advice; to Dr. G. C. Williams, Medical Officer of Health, Oxford C.B., for permission to carry out the investigation among the children under his care; to the medical officers and health visitors on his staff for their co-operation and active help; to Dr. E. Donaldson, Principal Regional Medical Officer, for his assistance in the choice of suitable residential nurseries; to the Waifs and Strays Society, the Margaret Club Day Nursery, the Whitefield Day Nursery, and the county councils of Buckinghamshire, Berkshire, London, and Oxfordshire, for permitting us to visit these nurseries; to the medical and nursery staff of each nursery we selected, particularly to Dr. J. A. Hill, Dr. G. N. Stathers, Dr. G. R. N. Henry, and Dr. N. Black; and to the Matrons of Cottesford House, Culham Court, Waddesdon Manor, and the Margaret Club Day Nursery for the collection of much of the data we needed. We particularly wish to thank Messrs Burroughs Wellcome and Co. for the free supply of vaccine

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PROBLEMS OF NAVAL WARFARE UNDER CLIMATIC EXTREMES*

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PART III.—LECTURE II (*continued*)

Psychological Effects of Long Service in the Tropics

A common opinion in the Tropics is that after about a year there is a noticeable deterioration in drive, alertness, keenness, memory, the capacity and speed of thought, and power of making decisions. These symptoms may be accompanied by an obvious lassitude, procrastination, irritability, sometimes bibulousness, and slovenliness in personal appearance. The better-educated are conscious of their own declining efficiency, and they note the same change in others; that is to say, the phenomena are both subjective and objective. The symptoms are popularly ascribed to the climate, whether hot and humid or hot and dry, and the point of view is freely ventilated that one to two years should be the maximum tenure in uncongenial tropical regions.

Since we are waging a naval campaign in equatorial waters, the problem has many important bearings. Medical advice is needed on several points. Do, in fact, changes in intellect or personality follow long tropical residence? If so, what is their nature?; how can they be prevented or alleviated?; what is the optimum duration of tour in the Tropics?

A new-comer may be struck by certain personality traits in some who have served for a time on a tropical station—traits made up of undue irritability, alcoholic indulgence, mild hypochondriacal preoccupation, and a tendency towards paranoid feelings of resentment. Castellani applied the term "cacophoria tropicalis" to a state of lassitude and mild general malaise. Whether actual falling off in performance and intellectual capacity exists we do not know for certain, but we suspect it. To determine the nature of this clinical picture is important. Superficially, the syndrome might strike one as representing a mild dementia with some personality deterioration were it not for the victim's clear insight and the fact that the condition is apparently "cured" after leave at home. More probably it belongs to the realm of the neuroses, with hysterical features motivated by a strong if thinly veiled desire to return home: in other words, a nostalgic reaction.

* Being the Croonian Lectures delivered to the Royal College of Physicians, July 10 and 12, 1945.

One must not assume that hot climate is the sole cause of this picture. The total situation must be visualized. Service factors such as boredom, isolation, lack of amenities including beer and familiar diet, home worries—financial or marital—all these occur and may outweigh the hazards of enemy action. Add the stresses and strains of disordered sleep, fatigue, bodily discomfort (perpetual sweating, skin irritations, diarrhoea, flies); and also the constant association with coloured folk and a growing intolerance of their inexplicable habits.

From a Service standpoint it is important to decide how much of this "tropical neurosis" is due to these auxiliary factors, some of which could perhaps be alleviated, and how much is due directly to climate. Though the literature upon this subject is growing, it is inadequate. Many tropical practitioners who have written upon the matter have not been psychiatrists, while the psychiatrists have not always had tropical experience. Of late there has been a tendency to decry the tropical neuroses and to minimize the part played by climate, as opposed to the many auxiliary factors.

The climatic factor would be supported if one could demonstrate: (1) that the same psychiatric features occur in tropical civilians whose homes and families are on the spot, having elected freely to take up a career in hot climates; (2) that nervous and mental symptoms do not occur when individuals live in artificially cooled quarters in the Tropics or when they have frequent spells up-country; (3) that the characteristics of the clinical picture are unlike those in neurotics at home: (4) that meteorological and clinical fluctuations run parallel: and (5) that the efficiency and the personality of tropical indigenes alter when they emigrate to a cool country. How far are these things possible?

1. It is difficult to escape the conclusion that neurotic symptoms are commoner in the Tropics than at home, though the incidence may be less in civilian than in Service personnel. There is agreement that loss of efficiency does gradually develop in the Tropics with time, that it is improved by leave in hill stations or in the United Kingdom, and that the civilian psychiatric picture resembles that seen in the Forces. That efficiency deteriorates is shown by the practice of the Colonial Office, and various banks and trading concerns, who have found that it pays to make compulsory long and frequent spells of leave at home.

Statistics reveal a high incidence of nervous or mental breakdown among civil servants in East and West Africa. Thus, psychiatric disorder was responsible for one out of every three invalidings from East Africa, and one out of every 2.7 from West Africa. Alcoholism was responsible for one out of every 24 and 30 respectively. (Tropical disease proper accounted for 1 out of 9 and 1 out of 10 respectively.) Of the deaths, 1 in 6 and 1 in 3.8 were directly due to tropical affections in East and West Africa, while 1 in 11 and 1 in 13 were suicides (see Table). These high figures, be it noted, apply to carefully selected Europeans who had chosen a career within the Tropics.

	East Africa							West Africa						
	Invaliding				Deaths			Invaliding				Deaths		
	Total	Trop. Dis.	N.P. Dis.	Alcohol	Total	Trop. Dis.	Suicide	Total	Trop. Dis.	N.P. Dis.	Alcohol	Total	Trop. Dis.	Suicide
1930	25	6	6	1	23	6	2	50	7	21	—	23	5	1
1931	29	3	15	4	24	6	1	48	2	21	4	37	15	3
1932	22	2	7	—	16	5	2	31	2	9	1	13	2	1
1933	23	2	4	—	18	1	3	40	5	12	1	15	6	1
1934	27	2	8	1	16	3	—	41	6	17	1	20	6	3
1935	16	2	3	1	19	6	2	37	4	14	1	15	2	2
1936	24	4	11	2	24	1	1	36	3	12	2	27	5	1
1937	26	2	8	1	22	3	4	45	3	15	1	18	5	1
1938	20	1	7	1	21	1	2	62	5	22	2	29	6	2
1939	18	2	5	1	16	2	—							
1940	11	—	6	1	25	4	3							
Total ..	241	26	80	10	224	38	20	390	37	143	13	197	52	15

N.B.—The cases of alcoholism are included within the totals for neuropsychiatric (N.P.) disorders.

Of 166 psychotic American soldiers in 1901, 120 were stationed in the Philippines and the rest in the United States; the following year the number was 114 out of 186. In 1903 the suicide rate for the U.S. Army at home was 7 per 100,000 and in the Philippines 16 per 100,000 (C. E. Woodruff).

2. No figures are yet available as to the incidence of neurosis before and after the air conditioning of homes and offices in the Tropics, though it has been shown that the output of work is considerably speeded up after the installation of cooling plants.

3. In some respects the tropical syndrome differs from the usual neurotic pattern. The earliest and prominent features of the tropical neuroses are intense irritability, poor memory, and mental and physical lassitude, while the characteristic anxiety and depression so common in our experience at home are much rarer and appear later. Then again, the frank psychoses of the Tropics show a certain bizarrerie in their picture. Nothing like the Malayan *latah* and *amok* can be found in our mental hospitals, though the cause may be racial rather than environmental. The same applies to the *koro* of the Celebes islanders and the *uas-uas* of the Tripolitanian Arabs. But among white troops in the East special clinical entities are sometimes described—the amoebiasis psychoneurosis, the depression of the rubber plantations, the mepacrine psychoses—though in all cases the suggested aetiology is dubious and the status of the syndrome insecure. Queer explosive and violent outbursts with confusion and subsequent amnesia occur on occasion among European troops in the Tropics, but they are not so much attributable to the climate as to the taking of native spirits—*arak, zebib, lagbi,* or *buha.*

4. In tropical and subtropical areas spells of inclement weather may cause great discomfort and exaggerate whatever psychiatric features already exist. This is illustrated by the hot dry winds of high velocity. Dexter noted that Denver school-children were more unruly when strong southerly winds were blowing. The *mistral* of the South of France is said to produce a curious irritable state—*le cafard.* In Libya and the Levant there is the *khamsin,* in West Africa the *harmattan,* and in Malta the *xirocco*—all of which are climatic phenomena directly associated with psychiatric anomalies.

5. When Indians, Chinese, and negroes take up residence in a cooler part of the world their capacity for efficient mental work probably improves. This idea is supported by M. MacKinnon, who has studied the intellectual growth of European children born or reared in Kenya. At first they developed a mental alertness far superior to that of children at home, but after the age of 10 or so a gradual mental exhaustion and deterioration was the rule. These phenomena were in his opinion due to climate—to the stimulating effect of sunshine followed by the ill effects of undue heat. The circumstances were complicated, however, by the high altitude at which the children were living.

Psychological Effect of Long Service in Polar Regions

Naval ratings usually fare better in the extreme north than in the Tropics. Likewise, Scott's Antarctic team found the passage out through hot humid weather more trying than the cold climate which came later. We can, however, descry psychiatric features in the Arctic as in the Tropics, though possibly to a lesser extent. There are affective disorders which one associates with the solitude, darkness, and icy cold of the long polar winters. According to Burton, melancholy might result from lying "in stoves and caves half a year together in Iceland, Muscovy, or under the Pole itself." Explorers have noted these manifestations. We recall the "barrack-fever" of the German Forces occupying the most northerly part of Norway. The Finns speak of a Värtrotthet, or "spring-tiredness," which comes on towards the end of the winter season. Then there is the "light hunger" described in Russia by Katz and the "sun-thirst" of Goethe. It is interesting that depression is the dominant symptom in these Arctic disorders rather than irritability or forgetfulness as in the tropical neuroses. Similarly the incidence of manic-depressive psychosis among the insane population of Iceland far outnumbers that of schizophrenia; the reverse is true of Norway, where the racial stock is similar but the climate different. Mental disorders of the Tropics are reflected in the extreme north by a number of strange psychotic states. Thus we have the *piblokto* of the Greenlanders, with its impulsive features; the Siberian *mirvachet,* with its coprolalia and mimetic symptoms, so similar to the Malayan *latah*; and the Labrador *wihtiko,* with its cannibalistic urges.

Again, we find in the Arctic the same explosive alcoholic episodes which are encountered in the Tropics. Bouts of berserker violence may follow sudden intemperance among the inhabitants of such "dry" countries as Iceland. As regards personality, the indigenous elements of the Arctic regions display apathy, slowness, and inefficiency just as in the Tropics. But the Eskimos and the northern Siberians are said to improve considerably in activity when transferred to a more habitable climate, as in the United States.

The conclusion would seem to be that climate *per se* can at times be held responsible for personality changes, and that it

may precipitate neurotic or even psychotic breakdown in certain predilected individuals; that it influences the pattern of the resulting clinical picture; and that it may, as Montesquieu taught, be one of the factors in determining the characteristics of the native population.

From a Service point of view there are certain practical lessons which will serve to avert breakdown of mental health in climatic extremes. These comprise the principles of (1) selection of the suitable and rejection of the unsuitable candidates for Arctic and tropical service; (2) determination of the most desirable limits of stay in such regions; (3) periodic leave periods in equable and agreeable environments; and (4) a complete welfare service in the fullest sense of the term, to maintain the comfort, spirits, interests, and morale of Forces serving in these exceptional circumstances.

Selection of Personnel Best Fitted for Tropical or Arctic Service

Artificial acclimatization has the incidental merit of directing attention to those who are unlikely to endure climatic extremes. Service requirements demand that the question of selection and rejection should be considered more fully. It must be realized that this practice does not yet stand upon the firm basis of an exact science. Further work in this direction is sorely needed not only for Service purposes but also for post-war Colonial development.

Some of the circumstances which cause an examiner to look askance at a candidate for foreign service are more significant than others. The contraindications for tropical and Arctic service may be regarded as either relative or absolute.

Contraindications

State of Physical Health.—Nothing is gained by listing the diseases which would afterwards preclude service in the Tropics or the Arctic, nor those minor and chronic maladies which are apt to flare up and become troublesome under extremes of temperature. This aspect of the problem is fairly well established.

Age.—The elderly do not tolerate heat or extreme cold as well as younger persons, especially if submitted to such a climate for the first time. Many would like to enforce an upper age limit of 35, or even of 30, upon those to be drafted to the Tropics or the Arctic. This may be too drastic, for the older sailor may have endured a hardening process in climates of another sort which may prove a good training for the immediate task. Scott's Antarctic expedition illustrates how well the rather older subjects can fare. His final Polar party consisted of five men, their ages ranging from 28 to 43. In his last letter Scott wrote: "*I want to tell you I was not too old for this job.* [He was 43.] *It was the younger men that went under first.*"

Body Build.—Tropical exigencies are less well tolerated by those of pyknic habitus than by the spare or by the tall lean types. When working in humid atmospheres a big man is perhaps at a disadvantage compared with a small one, for both will produce heat in proportion to their weight and dissipate it according to the ratio of body weight to surface area. Such was the case in S. Robinson's comparison of two subjects, but J. Weiner's analysis of over 200 miners showed only a slight correlation between heat tolerance and surface area. A poor musculature is not a handicap. In the case of cold climates, a generous amount of subcutaneous fat is of benefit, short of a pathological obesity with its attendant circulatory strain. Apart from the factor of fat-insulation, big persons on the whole tend to endure cold better than the small, just as the larger mammals are the ones to survive in the Arctic. Exceptions occur, of course, as in Scott's party, where they found "strength of will" more significant than physical constitution.

Physical efficiency tests might be most helpful if standardized. A step test has proved useful in the selection of recruits, and correlates well with subsequent performance in the heat. The virtues of any selection procedure which reproduces closely the actual conditions of work are obvious, and should be developed further.

Pigment.—There is some relationship between the pigmentation of an individual and his tolerance towards tropical life, though few would go all the way with Woodruff, who said that recruits for tropical Service should be limited to brunettes of short stature—the Mediterranean type, in fact. This same author tried to demonstrate a predominance of the blond in cooler climates and of the dark-skinned in the heat. Regarding sailors as essentially encompassed by a low-temperature environment (which of course is not the case), Woodruff has written: "*The blond type of man is now and always has been the best sailor. He takes to water like a duck . . . he is the yachtsman of the world, the boat-builder, and rules the sea at the present time.*" For Arctic service, cutaneous pigment is unlikely to influence the selection test, despite Woodruff's beliefs.

But certainly tropical Service is not for those who have such congenital defects of pigment as leucodermia. Albinos fare very badly in hot climates, and those rare cases of albinism in coloured people seldom attain adult age. Vitiligo, if sufficiently extensive, is a handicap. Persons who are of excessive or "platinum" blondness, especially if showing a tigroid fundus on ophthalmoscopical examination, are doubtful candidates for the Tropics.

Even the red-heads are suspect by virtue of their cutaneous intolerance towards the sun's rays. It has been said that the French Foreign Legion used to debar such candidates, but considerations other than photosensitivity might have been in mind.

Possible Biochemical Factors.—Experience both in the Tropics and in the far north shows that there are certain rare persons who are conspicuously intolerant of the heat, and others of the cold. Such heat-sensitive and cold-sensitive subjects are not conspicuous to ordinary medical tests; nor do they stand out by virtue of any feature of age, build, or colouring. It would be a convenience, at the very least, if it were possible to devise some test or criterion whereby these rare cases could be identified at home. No such hall-mark is known as yet, though a close physiological study is projected of all naval ratings who are invalided from the Tropics to the United Kingdom as being heat-sensitive. Alterations in the blood lipoid–phosphorus level and in the suspension stability test have been suspected, but not demonstrated, in such cases. It is possible that some inherent dysfunction of the sweat glands or of chloride metabolism, or both, may be a feature of the heat-sensitive. A fairly wide variation in the chloride content of the sweat is known to occur, but no serious attempt has yet been made to correlate the biochemical with the clinical data. The proportion of eccrine to apocrine glands may be significant in this connexion, as suggested by the known racial differences. Still more likely is a link between the total number and distribution of eccrine glands and heat tolerance. Unreadiness to sweat in hot atmospheres may be a factor in determining heat sensitivity. Thus Borchardt closed up 15 subjects for two to three hours in a hot room at 33° C. (91.4° F.), with a relative humidity of 90%. Seven of them sweated much less than the others, and these developed various distressful symptoms, their body temperatures rising considerably. Kuno regards those hypohidrotic persons as probably unsuited for tropical residence.

There are several possible causes of constitutional deficient sweating; there may be a relative insensitivity of the sweat centres in the hypothalamus, the medulla, or the spinal cord; or the sweat glands themselves may be abnormally sluggish in action or too few in number. With regard to the last point, it is important to note that those very rare persons with congenital absence of sweat glands should be absolutely precluded from the Tropics.

Sensitivity towards high temperatures may increase as the result of a previous attack of heat-stroke. For this reason, firms usually transfer an employee to the United Kingdom permanently on his recovery from such an illness.

The phenomenon of cold sensitivity exists in a small proportion of the population. Such display considerable distress and even syncope when exposed to low temperatures which would not incommode the average. B. T. Horton and G. M. Roth believe they can detect such cases in the laboratory. Five minutes' soaking of the hands in water at 8 to 10° C. (46.4 to 50° F.) will bring about flushing of the face, rapid pulse, and a fall in blood pressure. They believe that such can be desensitized in either of two ways: (1) by immersing the hands in water at 10° C. (50° F.) for one to two minutes twice a day for three or four weeks; or (2) by the subcutaneous injection of 0.1 mg. of histamine twice a day for two to three weeks.

An acquired sensitivity to cold may develop in those surviving severe exposure—as, for example, sailors who have been immersed for long periods in the sea or who have been adrift in waterlogged boats. A local hypersensitivity to cold is, of course, one of the characteristic sequelae of immersion-foot.

Psychological Factors.—It is certain that both tropical and Arctic regimes impose a psychological burden which may prove too heavy for some. On the whole, one would prefer the volunteer to the impressed man, though there may of course be a psychopathological motive for electing to serve in adverse climates. The psychopath and the unstable do not withstand the hardships of foreign service so well as those of placid and equable disposition. Those of poor intelligence or educational resource do not tolerate the boredom of some isolated tropical and Arctic appointments. Ratings with a bad crime record either in the Service or in civil life are most unsuited. The older practice of transferring the persistent offender to some remote and uncongenial station in the Tropics has proved intolerable. A previous severe neurotic breakdown is a relative disqualification, while any alcoholic tendencies should be regarded as an absolute contraindication both to tropical and to Arctic service.

Peacetime Implications

Warfare in hostile climatic conditions has compelled scientists to direct their attention towards protecting personnel against the exigencies. The lessons of war medicine hold out considerable promise for the post-war period. One has in mind the enormous expanses of our Empire which are at present underpopulated. The extension of air routes over the North Pole, the mineral resources of northern Canada and the Antarctic, the development of desert Australia and of the West Coast of Africa are problems for the future.

Tropical and Arctic disease are capable of control, and the way is open for further advances along these well-trodden paths. But there still remain the hazards and discomforts of extreme cold and heat. If men must fight in such environments it should be made possible for them to live and work there and raise families without the fear of swelling the "poor white" community.

Of the polar wastes we have the opinion of the explorer, Cherry-Garrard, that the Antarctic "is not half as bad a place for public service as the worst military stations on the Equator." But serious doubt has been expressed as to how far the Tropics can be developed. Balfour has said that under existing circumstances the white man in the Tropics is never more than a wayfarer or a sojourner. The Tropics, according to Carthew, are peopled by only three classes of European—the adventurer, the missionary, and the beachcomber—of which only the last makes the grade. While Dill believes that man can be made to thrive in desert wastes, the hot humid regions near the Equator have been suspected by such writers as Castellani, Huntington, Anderson, and Balfour as being wholly unsuited for European occupation in the present circumstances. Contrary views have been expressed by Cilento, Rohrbaugh, Gorgas, and others. The last believes that if malaria and sleeping sickness were stamped out, then the Congo could be colonized by the white race. The significant phrase is "in the present circumstances," because the eradication of disease, the new insecticides and repellents, air conditioning, and the free use of refrigeration have quite altered the problem of tropical habitability.

We can discern the need for a central Academy of Geomedicine or Climatology, wherein all research—medical and scientific—could be undertaken concerning both extremes of temperature. The fighting Services, colonization, geographical survey, agriculture, industry, communications, housing, would all be concerned. The first function would not be a study of disease states but of the physiology and psychology of performance, growth and fertility, vital statistics, textile research, protection of material against tropical and Arctic deterioration, and a fuller inquiry into ventilation, with a study of the influence of air conditioning upon human oecology. The Admiralty has under consideration the formation of a Tropical Research Unit, which could be regarded as the first move in this direction.

Conclusion

Let us conclude with two quotations as to the possible future development of unpropitious regions. Johnson in 1813, believing that man is better adapted than any other animal for migration from a northern to a tropical region, or the reverse, wrote: "*For this boasted prerogative, man is perhaps more indebted to the ingenuity of his mind than the pliability of his body. . . . Man, by the exertion of his mental faculties, can raise up a thousand barriers round him, to obviate the deleterious effects of climate on his constitution.*" The second quotation is from the geographer, Huntington: "*I want to know beyond question whether white man can live permanently in a tropical country, conquer the diseases, and make progress, without the help or hindrance of any coloured race. . . . I do not doubt the ultimate triumph of the white man over the Tropics, and much less do I despair of a white Australia. The process of selection for climate has never been really tested. All that has happened thus far has been purely fortuitous. The hope of the future, I believe, lies in an orderly and far-sighted selection of the right types of people, as well as in the further development of tropical medicine and hygiene.*"

To these ideas we would now also add the elaboration of an artificial climate in which to live and work.

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PRESERVATION OF HUMAN SPERMATOZOA AT LOW TEMPERATURES

BY

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Several experiments have been carried out, in the last few years, on the preservation of spermatozoa at low temperatures. This work is clearly in its early stages, but already very significant observations have been made on human as well as on avian and amphibian material. Luyet and Hodapp (1938) reported that a large percentage of frog spermatozoa showed motility after being partially dehydrated in 2 M-sucrose, spread in a thin film on a mica slip, immersed in liquid air, and thawed rapidly by plunging into medium warmed to 20° C. The technique of these authors was similar to one which had been successful with plant tissues, and was based on the assumption that the essential condition for survival of the spermatozoa was instantaneous freezing, to secure vitrification rather than crystallization of the water, and instantaneous thawing. Partial dehydration, by the addition of laevulose, was also used by Shaffner, Henderson, and Card (1941), who found that about one-third of fowl spermiatozoa could be revived after freezing at −79° C. Duration of freezing, up to 14 months, was not an important factor in survival rate. Spermatozoa revived after one hour at −79° C. were capable of effecting fertilization, but there was very early embryonic death (Shaffner, 1942).

In view of these results the discrepant experiments recorded in the literature dealing with human spermatozoa are of great interest. As long ago as 1897 Davenport recorded that human spermatozoa would survive freezing at −17° C. This interesting observation received little attention for many years, but in 1938 Jahnel found that a proportion of human spermatozoa could be revived after freezing in glass tubes for 40 days at −79° C., or for shorter periods at −196° C. and −269° C. Jahnel does not state the diameter of the tubes used, but he did not apparently take any special precautions to ensure the utmost rapidity of freezing and thawing. Shettles (1940) froze human semen in glass capillary tubes 0.2 mm. in diameter, and obtained a low percentage revival of the spermatozoa from −79° C., −196° C., and −269° C. A few spermatozoa revived after 70 days at −79° C. Shettles emphasizes the importance of the freshness of the specimen. Hoagland and Pincus (1942), following up the premises of Luyet and Hodapp and using liquid nitrogen, tried an elaborate series of devices to facilitate the instantaneous vitrification and thawing of human semen. However, except in one or two isolated experiments, the revival rate was very poor. No spermatozoa could be revived after vitrification in fine capillary tubes.

The results of Hoagland and Pincus are in strange contrast to those of Jahnel, whose work is not cited by the American authors, and the discrepancy shows that other factors than mere rate of vitrification and thawing have to be considered. From a practical point of view, the question is of some importance. Jahnel's results suggested that the prolonged storage of human semen at low temperatures might be possible; the results of Hoagland and Pincus, on the other hand, offered no such prospect. The experiments described below were therefore carried out on the low-temperature preservation of human spermatozoa.

Technique

Semen was obtained from several different donors; all specimens were rated normal by the usual seminological examination. No marked difference in resistance to freezing was noted between the different samples. The semen was allowed to liquefy before being used, and was not diluted. In experiments with capillary tubes the semen was allowed to rise in the tube and the end was then sealed. Unless otherwise stated, immersion in the freezing medium was always for one minute, thawing being done by transferring the film, tube, or ampoule as rapidly as possible to medium or water at 37° C. Freezing fluids, other than liquid nitrogen (−195.8° C.), were made by cooling ethyl alcohol with solid CO_2. Quart-size vacuum flasks were used as containers.

Results

In a preliminary experiment a comparison was made by immersing semen in liquid nitrogen (*a*) as a thin film in a platinum loop, (*b*) in a very fine capillary tube (internal diameter approximately 0.15 mm.), (*c*) in a coarse capillary tube (internal diameter approximately 0.5 mm.), (*d*) in thin glass tubing (internal diameter approximately 1 mm.). After thawing, no motile spermatozoa were seen in the semen from (*a*) or (*b*); they were abundant in that from (*c*) and (*d*). A repeat experiment gave similar results. It seemed, therefore, that the results both of Jahnel and of Hoagland and Pincus were reproducible, and considerable doubt was cast on the idea that speed of freezing and thawing was the primary factor in the survival of human spermatozoa. A more extended experiment was carried out in which the temperature of freezing as well as the bore of the container was varied. The results are given in the accompanying Table. Although survival at −20° C. was not prolonged, these results give little support to the view of Luyet that freezing under conditions leading to the formation of ice crystals is incompatible with the survival of the spermatozoa, but they confirm the previous result that some inimical factor is associated with freezing in a very fine capillary tube. The nature of this factor is not clear, though a surface effect of some kind seems to be indicated. Pressure as such is not likely to be involved, since Marsland and Rugh (1940) showed that spermatozoa are unaffected by hydrostatic pressure.

Table showing Revival of Human Spermatozoa After Exposure to Low Temperature for 1 Minute or 5 Hours

Temperature	Freezing for 1 Minute in Capillary Tubes of Diameter of			Freezing for 5 Hours in Capillary Tube of Diameter of 1 mm.
	0·15 mm.	0·5 mm.	1 mm.	
− 20° C.	0	+	+	0
− 79° C.	0	+	++	++
−196° C.	0	++	++	++

0 = No revival. + = Some spermatozoa revived. ++ = Abundant spermatozoa revived.

In view of the successful results obtained with comparatively wide tubing attention was turned to the use of ampoules, and 1 c.cm. of semen was frozen at −196° C. in an ordinary 5-c.cm. pyrex ampoule. On thawing out, numerous active spermatozoa were seen in the sample.

Consideration was then given to more prolonged storage of the vitrified material. Maintenance at −196° C. for any lengthy period was clearly impracticable with the apparatus available. The results given in the Table, however, do not suggest that when 1-mm. tubes are used there is any advantage in vitrifying at −196° C. as compared with −79° C. An experiment extended this conclusion for larger containers, and further showed that transference from −196° C. to −79° C.

had no adverse effect. Ampoules containing 1 c.cm. of semen were therefore vitrified at −196° C. or −79° C. and maintained at the latter temperature for 2 days and 8 days. In each case thawing out showed that an abundance of spermatozoa had survived. A long-term experiment has now been set up, but in view of the work of Jahnel and of Shettles it is fairly certain that under optimum conditions large numbers of human spermatozoa will survive prolonged vitrification.

A much more important and doubtful point is whether vitrification affects the power of the spermatozoon to fertilize and activate the egg and induce normal embryonic development. In the experiments on fowl spermatozoa, quoted above, normal development was not induced after freezing for 1 hour at −79° C., but the partial dehydration before vitrification may have affected their genetic properties. The question is of great interest. Artificial insemination of humans will no doubt become increasingly common, and the elaboration of a method permitting of prolonged storage and transport of the semen without affecting the genetic properties of the spermatozoa would open up remarkable possibilities. It is not obvious how the problem of genetic modification is to be investigated with human material, and it is unfortunate that the spermatozoa of laboratory mammals, including those of the Rhesus monkey, are killed by vitrification under any conditions so far investigated.

Summary

A large proportion of human spermatozoa survive for long periods in semen frozen in bulk at −196° C. or −79°C.

Spermatozoa do not survive when minute amounts of semen are frozen as films or in fine capillary tubes.

The rate of freezing and thawing is not the primary factor in the survival of human spermatozoa exposed to low temperatures.

I am much indebted to Dr. P. M. F. Bishop, Guy's Hospital, for making arrangements with the donors.

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HAEMOLYTIC STREPTOCOCCAL THROAT INFECTIONS: THEIR COMPLICATIONS AND SEQUELS

WITH SPECIAL REFERENCE TO PENICILLIN TREATMENT

BY

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The British garrison in a small Italian harbour town has recently had a very high incidence of carriers of haemolytic streptococci. No systematic survey had been attempted, but a throat swab from any unselected person not showing in the culture at least a few colonies of haemolytic streptococci was an unusual occurrence. Accordingly the number of admissions for haemolytic streptococcal tonsillitis was considerable—79 cases, including 11 peritonsillar abscesses, in 6 months. A few complications such as pneumonia and scarlet fever also occurred. Along with the streptococcal infection ran a high incidence of erythema nodosum and acute rheumatism—some of the cases developing under our very eyes.

The material may be divided in two groups: the first covers the period Nov., 1944, to Jan., 1945, and comprises 34 cases of tonsillitis, including two peritonsillar abscesses, 3 cases of pneumonia, 1 of scarlet fever, 4 of erythema nodosum, and 6 of acute rheumatism: the second group of patients, treated in Feb.–April, 1945, consists of 43 cases of tonsillitis—including 9 peritonsillar abscesses, 7 cases of erythema nodosum, and 11 cases of acute rheumatism.

Acute Tonsillitis

No special attention at first had been paid to the mild cases. If the temperature did not rise above 102° for more than two days no treatment was given. The throat swabs remained positive in almost every case. An attempt to sterilize the throats in a number of cases through frequent spraying with sulphathiazole powder or calcium penicillin powder failed completely. Cases with pyrexia in the first group were given 20 to 30 g. of sulphathiazole, but the results were no better. Six of the 32 cases returned with a recurrence of their symptoms.

Encouraged by the favourable results achieved by MacGregor and Long (1944) with penicillin pastilles, we introduced them as a routine treatment at the end of January. In preparing the pastilles we followed the technique described by these authors, and gave 10 pastilles daily, 1½-hourly, until the throat became clear. A throat swab was taken on admission, and treatment started at once. Anything between 18 and 46 pastilles was given. On completion of treatment a throat swab was taken again, and the patient was discharged from hospital if it was sterile. No recurrence of symptoms and no complications occurred in this group. The clinical and bacteriological results are summarized in Table I.

TABLE I.—*Haemolytic Streptococcal Tonsillitis*

	Mild Cases (Temperature not above 102° for more than Two Days)				Moderate and Severe Cases (Temperature above 102° for Two or More Days)			
	No Treatment	Sulphathiazole Spray 4-hourly	Calcium Penicillin Spray 4-hourly	Penicillin Pastilles	Sulphathiazole 20–30 g.	Sulphathiazole 20–30 g. and Calc. Penicillin Spray	Sulphathiazole 20–30 g. and Penicillin Pastilles	Penicillin Pastilles only
No. of cases ..	6	6	6	18	7	7	8	8
Clinical cure in days	4–11	5–10	6–11	3–5	5–21	6–22	3–7	2–9
Average	(7)	(6)	(8)	(3½)	(14)	(13)	(5)	(6)
Days in hospital ..	7–14	7–16	8–14	5–10	8–33	8–30	5–10	4–14
Average	(10)	(11)	(11)	(18)	(17)	(16)	(8)	(8)
No. of patients with positive cultures before discharge ..	5	6	5	0	5	7	0	1

No claim of a permanent sterilization can be made. In two cases of chronic tonsillitis throat swabs remained positive after 88 and 126 pastilles.

Peritonsillar Abscesses

The two patients with peritonsillar abscesses in the first group were given 30 g. of sulphathiazole and inhalations. One recovered in 12 days, but his general condition did not allow discharge from hospital until the 28th day. Repeated throat swabs showed pure growths of haemolytic streptococci. The second was very seriously ill for 3 days and a tracheotomy was considered; he recovered slowly, and left hospital after 26 days. The throat swab before discharge still showed a good growth of haemolytic streptococci.

The results in the nine cases of the second group are summarized in Table II.

TABLE II.—*Cases of Haemolytic Streptococcal Peritonsillar Abscesses Treated with Penicillin Pastilles*

Patient No.	No. of Penicillin Pastilles Given	Subjective Relief (Days)	Clinical Cure (Days)	Discharge from Hospital After (Days)	Throat Swab on Discharge
1	22	1	3	8	Sterile
2	18	1	2	8	,,
3	40	2	4	9	,,
4	28	2	3	10	A few colonies of haemolytic streptococci
5	32	1	3	8	Sterile
6	36	1	4	7	,,
7	20	1	2	6	,,
8	38	2	4	11	,,
9	42	1	4	9	,,

Erythema Nodosum

The four cases of erythema nodosum in the first group occurred in Jan., 1945, all in patients with mild haemolytic streptococcal tonsillitis—two untreated and two treated with sulphathiazole spray. In one of each group acute rheumatism followed. The rash faded after 8 to 11 days, during which period throat swabs constantly showed a growth of haemolytic streptococci. The erythrocyte sedimentation rate

was, and remained, high in the two cases followed by acute rheumatism, and became gradually normal within three weeks in the other two. Five more cases of untreated haemolytic streptococcal tonsillitis developed erythema nodosum at the end of Jan., 1945, when treatment with penicillin pastilles was introduced; they had been given the pastilles as soon as the rash became evident. Two more cases were admitted with a history of erythema nodosum of 1 to 2 days' duration; they also were given penicillin pastilles. In one of them acute rheumatism followed very soon. In all those instances in which penicillin pastilles were given the rash faded and disappeared in 1 to 3 days, and the erythrocyte sedimentation rate dropped from values ranging between 23 and 54 mm. per hour to less than 10 mm. per hour on the fifth day at the latest, with the exception of the one followed by rheumatic fever. All throat swabs became negative within 4 days. All the 11 cases of erythema nodosum had a thorough clinical and radiological examination to exclude tuberculosis.

On two occasions "erythema nodosum" appeared in patients with lobar pneumonia under sulphathiazole treatment. The E.S.R. was 10 and 14 mm. per hour. Sulphathiazole was discontinued, and the rash disappeared within 24 hours. Not a single patient suffering from haemolytic streptococcal tonsillitis and treated with penicillin pastilles developed erythema nodosum.

Acute Rheumatism

Six of our tonsillitis cases of the first group developed rheumatic fever while in hospital; two of them—as mentioned—have also had erythema nodosum. None of the patients treated with penicillin pastilles showed any signs of acute rheumatism. From those admitted with already evident symptoms, 6 were fresh cases and 4 relapses. All but one gave a history of recent tonsillitis, and all throat swabs showed a growth of haemolytic streptococci.

The first six patients were treated with intramuscular penicillin injections. In all but one case pyrexia did not last for more than two days, and the E.S.R. returned to normal at the 14th day at the latest. The swelling remained confined to the primarily affected joints, and subsided in 3 to 10 days. Only one had a clinical course which, though mild, could not be regarded as affected by treatment. Of the patients who were admitted with already developed rheumatic symptoms, 3 fresh and 2 relapsing cases were given penicillin treatment; the rest had the customary doses of sodium salicylate. Two of the primary and one of the relapsing penicillin-treated cases showed the course described above. All the others presented the well-known clinical picture of this disease.

The maximum amount of penicillin given was half a million units. It is noteworthy that three of those patients whose course of illness seemed to have been affected by the penicillin treatment liked the tiresome three-hourly injections immensely and begged us not to discontinue them.

Comment

The superiority of penicillin to sulphonamides in treatment of haemolytic streptococcal infections had been sufficiently stressed by the American National Research Council (1943) and Herrel (1944). The results achieved by Plummer *et al.* (1945) in throat infections with systemic penicillin treatment are better than ours—"Improvement in 8 to 12 hours, fever normal in 24 hours, and all throat swabs negative in 48 hours"—but relapses and complications were frequent unless the treatment was carried through for six days. MacGregor and Long (1944) had good results with penicillin pastilles, but found the treatment of carriers disappointing. The longer duration of illness in our patients as compared with those of Plummer *et al.* may be considered partly counterbalanced by the absence of recurrences and complications and the cheapness and simplicity of the treatment. Our results with peritonsillar abscesses can safely be described as striking; on several occasions the abscesses "melted away."

The relatively frequent occurrence of erythema nodosum is of some theoretical interest. Though there is a tendency to minimize the importance of the "rheumatic" origin as compared with the tuberculous, experimental work has shown that streptococcal nucleoprotein can cause the typical eruptions (Collis, 1932; Coburn and Moore, 1936). Lymphopathia venerea and sulphonamides may also cause "erythema nodosum." It seems feasible that just as discontinuation of sulphonamides is followed by disappearance of the eruption, so sterilization of the throat with penicillin pastilles may abort or even prevent the development of erythema nodosum.

Though acute rheumatism may follow different infections (Copeman, 1944), the connexion with haemolytic streptococci is certainly common, as shown only lately for the Canadian Army (Feasby, 1944). We are unable to explain by coincidence alone the benign course of several of our cases treated with penicillin. This is in contradiction to the conclusions of Watson *et al.* (1944), Herrel and Kennedy (1944), and Foster *et al.* (1944); the last-named author believes even in a deleterious effect of penicillin. The number of cases reported by these authors seems to us too small for a definite conclusion.

Summary

Acute haemolytic streptococcal tonsillitis and peritonsillar abscess respond well to treatment with penicillin pastilles.

Erythema nodosum following haemolytic streptococcal tonsillitis may be aborted, and possibly prevented, by penicillin pastilles.

Some cases of rheumatic fever seem to respond to systemic penicillin treatment.

I wish to thank Lieut.-Col. J. Pyle, C.O. of the hospital, for permission to publish this paper; and Sister K. Keogh, Q.A.I.M.N.S., for her valuable assistance in observation and treatment of the patients.

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TWO UNUSUAL STRESS FRACTURES

BY

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AND

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Stress fracture, as represented by spontaneous fracture of a metatarsal, usually the second, was common enough during the war of 1914–18, but stress fractures of other bones were not recognized as such at that time, and very little was heard on the subject until Roberts and Vogt, in 1939, published 12 cases of "pseudo-fracture of the tibia." Since then stress fracture—to use the most popular name—has been recognized in a variety of sites. That it is a true spontaneous fracture and not a "pseudo" was first demonstrated in one of Hartley's (1942) cases, although fracture with displacement did occur in one case of Roberts and Vogt's, but there trauma could not be altogether excluded. Now stress fractures have been reported as occurring in metatarsals, fibula, tibia, femur—shaft and neck—pubis, vertebrae, and first rib.

In two of the early series of cases published, where the bone involved was the tibia, the average age of the patients was just over 10 years. In all series those affected are almost entirely adolescent or in the early twenties and involved in strenuous exertion; though in 1940 Jackson Burrows reported a case of spontaneous fracture of the lower third of the fibula in a lady of 61 years who had been leading an energetic life. It is this almost invariable history of early age and strenuous exertion in cases of stress fracture which has prompted us to describe in detail the following two cases.

Case 1

Miss C., aged 64, housekeeper. She was first seen by one of us on Oct. 6, 1944, when she complained of pain in the upper third of the right tibia of one month's duration. There was no history of injury; her work was not hard and her duties had not varied for a number of years. The pain was described as gnawing in character, and, strangely enough, was most severe at night, being

sufficiently so to keep her awake. On Sept. 27 she had been radiographed at the request of her own doctor, but no lesion was found. Clinically the only positive finding was slight thickening and pitting at the site of pain, and marked osteo-arthritic grating of both knees. *X*-ray examination at this stage showed the early stages of what later proved to be a typical stress fracture. Films taken at intervals revealed all the features of stress fracture, both in its incipient stage and in its progress. The nick in the cortex followed by a clear infraction, with later the typical transverse zone almost right across the shaft, was clearly demonstrated.

The second case is most interesting from the point of view of differential diagnosis, for at one stage the *x*-ray films were so suggestive of sarcoma that a biopsy was performed.

Case II

Pte. T., aged 18. After a strenuous infantry exercise the patient complained of pain in the left knee. There was no history of injury. The pain had been present for some weeks before he was sent to hospital. When seen there it was referred to the knee-joint generally, but more especially to the medial side of the lower end of the femur, where a tender bony-hard swelling could be felt. Full range of knee movement was present. Radiologically (Fig. 1)

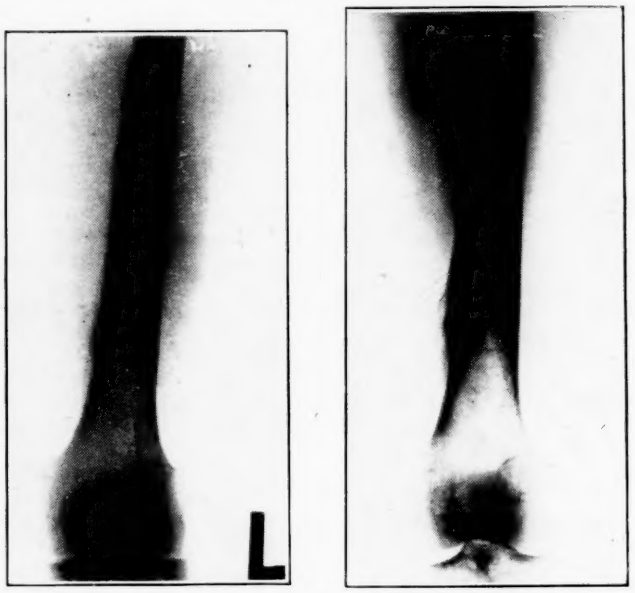

FIG. 1.—Case II. The broad-based pyramid is clearly seen and layering of the periosteum can be made out.
FIG. 2.—Case II. The layering is more clearly seen.

the swelling was seen to be due to a heaping up of poorly calcified bone in a low broad-based pyramid, and extending along the femoral shaft in both directions from its base was a thin layer of similar new bone. This layer was seen on the medial, anterior, and posterior surfaces, extending practically to mid-shaft. Underlying the pyramid was a region of endosteal new bone extending nearly halfway across the shaft. A cortical nick could be clearly seen in the negative. A tentative diagnosis of stress fracture was made at this stage. The onion-skin layering of the new bone extending along the shaft, however, gave rise to some anxiety. Control films of the opposite femur failed to show any similar changes. The Wassermann reaction was negative, and at no time was there any sign of local inflammation. Ewing's tumour and osteogenic sarcoma were considered, but it was decided to watch the progress of the swelling and take frequent control radiographs.

With rest in bed the tenderness and pain diminished, and at the end of three weeks the swelling had not increased in size. Films at this stage showed that the new bone was more densely calcified and better defined. At the end of another three weeks the clinical condition was unchanged, and a radiograph (Fig. 2) showed a further increase in density of the new bone mass, and its outline was smoother.

We now felt that the diminution of pain and tenderness, taken in conjunction with the radiological findings, indicated a healing lesion and almost confirmed our earlier diagnosis of stress fracture; but we were still uneasy about the earlier periosteal changes, and so a biopsy was performed. When the swelling was exposed (D. A. R.)—and this was done easily, there being no infiltration of the surrounding tissues—the pyramid was found to be hard, smooth, and rounded, and it easily scaled off the underlying bone, leaving a smooth normal-looking cortex. A portion of the cortex and underlying cancellous bone was removed. Macroscopically this could not be distinguished from normal bone.

The specimens were examined microscopically by Dr. J. Carr Brundret, who reported the presence of subacute and chronic osteitis compatible with the clinical diagnosis of stress fracture. There was no evidence of Ewing's tumour or sarcoma.

Still later films showed a more calcified new bone which was gradually merging into the normal cortex, and four months after the onset of symptoms the man was discharged to his unit.

Comment

Of these two cases the second is the more unusual, and both clinically and radiologically the more important. The first presents four unusual features—the relatively advanced age of the patient, the nocturnal pain, the absence of a history of strenuous exertion, and the presence of well-established osteo-arthritis; but, apart from that, the behaviour of the case was that of a typical stress fracture, and the diagnosis was never in doubt. Diagnosis was much more difficult in the second case, for while the changes seen radiologically to be taking place within the cortex were those usually associated with stress fractures, the much more widespread subperiosteal changes were very suggestive of sarcoma.

We wish to thank Dr. R. Fawcitt and Dr. J. Blair Hartley for their criticism and help with the films.

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TUBERCULIN TESTING IN CHILDREN

A COMPARISON OF METHODS

BY

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The investigation here reported has been carried out with a view to comparing the sensitivity of children to three forms of the tuberculin skin test: first, the Mantoux intradermal test; second, the Vollmer patch test; third, the diagnostic tuberculin jelly test.

In all, 380 children were tested, of whom 200 did not react to any of the tests. It is with the remaining 180 children that we are concerned. These 180 are made up of two groups of children: first, cases in a sanatorium, diagnosed on clinical, radiological, or bacteriological grounds as cases of active tuberculosis, the lesions being pulmonary, glandular, or in the bones or joints; second, cases attending a children's hospital that were found to be suffering from unexplained cough or glandular enlargement or showed other signs or symptoms giving rise to a suspicion of tuberculosis, or children who gave a history of contact with open tuberculosis.

Technique.—The Mantoux test was performed by the injection of 0.1 c.cm. of 1/10,000 old tuberculin into the skin on the flexor aspect of the forearm, and was read 48 hours after injection. Where this reaction was negative the test was immediately repeated, using 1/1,000 old tuberculin and reading again after 48 hours. The Vollmer patch and the jelly tests were both applied on the back between the shoulder-blades after the skin had been cleaned with aether meth. The jelly was applied in the shape of the letter V, each arm of the V about 1/2 in. long. The jelly was immediately covered by a large patch of elastoplast, about 3 in. by 2 in., extending well beyond the area of skin covered by the jelly; in this way any skin reactions to the elastoplast could be distinguished from reactions to the jelly; in fact, no such reactions were encountered.

The patches used in all the cases here recorded were fresh and from one source. Both patch and jelly tests were read after 48 hours.

Interpretation of Tests.—A positive Vollmer patch test was recorded if the reaction was positive either to human or to bovine tuberculin, or to both. A positive Mantoux was recorded if, after 48 hours, there was a palpable wheal not less than 3/4 cm. in

diameter with an area of surrounding erythema. A positive jelly test was recorded where either limb of the V showed wheal formation with surrounding erythema.

Results

The results of the tests on these 180 children are set out in the tables below.

TABLE I.—*Sanatorium Series*

Mantoux Tub. 1/10,000	Vollmer Patch	Tub. Jelly	No.
+	−	−	3
−	−	+	0
+	+	+	31
+	−	+	24
+	+	−	0
−	+	+	0
−	+	−	0
58	31	55 (94·8%)	58

TABLE II.—*Hospital Series*

Mantoux Tub. 1/10,000	Vollmer Patch	Tub. Jelly	No.
+	−	−	54
+	+	−	0
+	+	+	31
+	−	+	16
−	+	+	0
−	+	−	0
−	−	+	1*
101	31	48 (47%)	102

TABLE III

Mantoux Tub. 1/1,000	Vollmer Patch	Tub. Jelly	No.
+	+	+	0
+	+	−	0
+	−	+	1*
+	−	−	20
−	+	+	0
−	+	−	0
−	−	+	0
21	0	1 (4.8%)	21

* The same case.

These figures show that the chance that the results shown in Table III could have been obtained by random sampling of the same population (the same, that is to say, in the degree of correspondence between positive Mantoux tests and positive jelly tests) as that from which those in Table II were drawn is so low as to be negligible. In fact, the cases in Table III were all those which, by not reacting to the Mantoux at 1/10,000, failed to qualify for inclusion in Table II. One child, who is recorded as reacting only to the jelly test in Table II, reappears as a reactor to the Mantoux at 1/1,000 in Table III.

In respect of frequency of positive jelly tests among the positive reactors to Mantoux 1/10,000, the hospital series (Table II) gives a significantly lower figure than the sanatorium series (Table I)—47% as contrasted with 94.8%.

Now, the hospital series as a whole (Tables II and III) might be considered as a mixture of subjects with *developing* tuberculin sensitivity, whereas the sanatorium subjects (Table I) were, by selection, a sample of *developed* tuberculin sensitivity. It is therefore possible that the sensitivity of the subjects recorded in Table I was, on the average, greater than that of the subjects recorded in Table II. On this view the difference in frequency of positive jelly tests in Tables I and II would be interpreted as meaning that a high degree of correspondence between the two tests could be expected only in subjects who showed a positive reaction to the Mantoux test at a considerably higher dilution than 1/10,000.

Discussion

In a communication by Donald Paterson (*Journal*, April 15, 1944, p. 531) an account was given of the testing by Vollmer patch, Mantoux test, and tuberculin jelly of 100 selected children, of whom 32, 35, and 35 were found to be positive reactors to these tests respectively. It was not stated whether the 35 subjects who gave positive jelly reactions were the same as the 35 who gave positive Mantoux reactions, or whether they included the 32 giving positive patch tests, but this is to be inferred from the conclusion that "it would appear that in this series tuberculin jelly was a more accurate method of performing the skin test than the Vollmer patch." With this conclusion the results here presented are in agreement. But Paterson does not state explicitly what strength of old tuberculin was used in the Mantoux tests which he records. Writing of the reaction of the tuberculin jelly, he states that "experience has shown that . . . the reaction is equivalent to that of 0.1 c.cm. 1/100 old tuberculin (intracutaneous Mantoux test)." In the series here recorded we have not used intracutaneous old tuberculin in greater doses than 0.1 c.cm. of 1/1,000, but a comparison of the two tables showing Mantoux tests at 1/10,000 and 1/1,000 would suggest that a series of children who reacted only to 0.1 c.cm. of 1/100 would give a still lower figure of correspondence between the jelly and the Mantoux tests.

Clinical Notes.—Though it is no part of the purpose of this communication to discuss the significance of these reactions to tuberculin, certain points of interest relating to the clinical condition of these children may be noted. As has been said, the positive reactors in the sanatorium series were children who had all been diagnosed as cases of active tuberculosis. Among the children given us to test six were found who did not react to any form of tuberculin. Subsequent reference to the notes on these cases showed that on clinical and radiological grounds they had already been diagnosed as suffering from "non-tuberculous lesions." In the hospital series of 122 positive reactors 24 were diagnosed as cases of active tuberculosis. In 8 of these cases the tubercle bacillus was recovered by gastric lavage; the others showed either typical radiological appearances or pyrexia, loss of weight, chronic cough, enlarged glands of neck, inflamed joint, or gave a history of contact with open tuberculosis. In this hospital series were three cases of miliary tuberculosis with meningitis, confirmed at necropsy. It is interesting to note that all three gave a positive reaction to the Mantoux test at 1/10,000. Only one gave a positive reaction to jelly and none gave a positive patch test. It may be noted that all these 24 cases diagnosed on clinical and radiological grounds as suffering from active tuberculosis reacted to the Mantoux 1/10,000, and in this sense are comparable with the children in the sanatorium series.

Summary

As compared with the Mantoux test, the Vollmer patches used in this investigation appear to be unreliable to the point of being valueless.

The reaction to the diagnostic tuberculin jelly varies markedly in the two series: in the hospital series 47% of positive reactors to 1/10,000 Mantoux reacted to jelly, whereas in the sanatorium series 94.8% reacted. Of the 21 cases that reacted to the Mantoux test only when performed with 1/1,000, one gave a positive reaction to the jelly, and none to the Vollmer patch test. It seems clear that the jelly is a less sensitive test than the Mantoux in the dilutions used here, and is found to be positive only in those cases with a relatively high degree of allergy to tuberculin.

We wish to thank Dr. W. A. Bullough, county medical officer, school medical officer, and chief tuberculosis officer, Essex County Council, and Dr. M. C. Wilkinson, medical superintendent of Black Notley Sanatorium, for allowing us to apply these tests to their patients; and Dr. R. B. Fisher for advice on the statistical aspects of the results.

The annual report of the Professional Classes Aid Council for 1944–5 was presented by the president, Viscount Hailsham, at the annual general meeting held on July 5. The Council was founded in 1914 to meet the needs of professional men and women among whom the outbreak of the last war had caused distress. It was reconstituted in 1921 because of the need for a comprehensive and permanent system of relief for members of the professional classes and their dependants who had suffered seriously from that war and post-war conditions. It is composed of representatives of most of the benevolent funds of the professional associations, and its work is carried on in close co-operation with them. Lord Moran, P.R.C.P., succeeds Lord Dawson of Penn as Patron for the medical profession, and the British Medical Association and the Royal Medical Benevolent Fund are represented by Dr. Henry Robinson and Dr. W. P. S. Branson. The present war has put a heavy strain upon the funds of the Council, with the result that there has been a mounting deficit at the end of each year. The office is at 20, Campden Hill Square, London, W.8.

POST-OPERATIVE VOMITING IN RELATION TO ANAESTHETIC TIME

BY

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General anaesthesia is a temporary pathological state, but with the improvements in methods of administration of the last few decades there is a tendency for light general anaesthesia to be regarded as harmless. On the whole it may be true that no lasting harm accrues from prolonged anaesthesia, but it would appear, from observations made over a period of 18 months on the incidence of post-operative vomiting, that the duration of anaesthesia is a definite factor in the amount of constitutional upset and post-operative discomfort in the patient.

Adult Cases

The cases from which these figures have been drawn were largely (90%) patients undergoing plastic surgical procedures, mostly in the head and neck regions and requiring endotracheal anaesthesia. In a large number operations were performed in and around the mouth and nose, and a few of these patients inevitably swallowed small quantities of blood post-operatively. All the cases in this series had premedication by omnopon gr. 1/3 and scopolamine gr. 1/150 about an hour before operation. Atropine gr. 1/100 was substituted for scopolamine in patients over 50 years of age, and in occasional cases the dose of omnopon and scopolamine was reduced on account of debility or low body weight.

Anaesthesia was induced in every case by pentothal sodium and maintained by nitrous oxide and oxygen. If 75 to 80% nitrous oxide proved insufficient to maintain adequate anaesthesia, supplementary pentothal, ether, or cyclopropane was employed. A 2% amethocaine jelly was used as lubricant for the endotracheal tubes. Anaesthesia was confined to the first plane except in a few instances where bone or cartilage grafts were taken from the ilium or costal margin. Neither of these procedures, however, requires the depth of anaesthesia needed for relaxation in even a lower laparotomy.

No attempt was made to distinguish between degrees of vomiting, nor was nausea taken into account, conclusions being based on the presence or absence of actual vomiting. In some cases observations were complicated by sulphonamide therapy, and in these any vomiting which occurred later than 12 hours after operation was disregarded.

Duration of operation is divided, as conveniently set out in the perforated anaesthetic record cards introduced by Nosworthy (1943), into four classes: (1) less than 1/2 hour; (2) less than one hour; (3) less than two hours; (4) longer periods. Total cases showed a progressive rise in the incidence of vomiting with the duration of anaesthesia (Table I).

TABLE I.—*Time in Hours*

	Under 1/2	Under 1	Under 2	Over 2
Total cases ..	151	349	459	104
Vomited ..	41 (27%)	98 (28%)	199 (43%)	55 (53%)

Divided into sex groups (Tabie II) the incidence shows an even more marked progressive increase with the duration of anaesthesia; this table also demonstrates a considerable predominance of vomiting among women, as reported by Davies (1941).

TABLE II.—*Sex Incidence*

Hours:	Under 1/2		Under 1		Under 2		Over 2	
	Men	Women	Men	Women	Men	Women	Men	Women
Total cases ..	67	84	229	120	277	182	69	35
Vomited	8	33	34	64	84	115	22	33
,, Men ..	12%	—	15%	—	30%	—	32%	—
,, Women ..	—	38%	—	53%	—	63%	—	94%

In many cases no supplement to the nitrous oxide was required for maintenance; in the others so small a quantity of the additional agent was used that one would expect very little alteration in the figures for the different supplementary agents (Table III). This does not appear to be the case, but the totals on which the percentages are based are perhaps too small to offer satisfactory evidence. They suggest, however, that both ether and, to a lesser extent, cyclopropane increase the incidence of vomiting. The variation with duration is still largely upheld.

TABLE III.—*Vomiting with Use of Supplementary Agents*

Hours:	Under 1/2		Under 1		Under 2		Over 2	
	Men	Women	Men	Women	Men	Women	Men	Women
Pentothal, nitrous oxide, oxygen								
Total cases ..	43	41	116	67	138	76	26	12
Vomited	6	11	15	30	31	45	8	11
,, Men ..	14%	—	14%	—	22%	—	31%	—
,, Women ..	—	27%	—	45%	—	59%	—	92%
Pentothal, nitrous oxide, oxygen, cyclopropane								
Total cases ..	5	6	33	16	46	27	17	20
Vomited	1	3	6	10	12	18	2	19
,, Men ..	20%	—	18%	—	26%	—	12%	—
,, Women ..	—	50%	—	62%	—	67%	—	95%
Pentothal, nitrous oxide, oxygen, ether								
Total cases ..	19	37	80	37	93	79	26	20
Vomited	1	19	13	24	41	52	12	19
,, Men ..	5%	—	15%	—	44%	—	46%	—
,, Women ..	—	51%	—	65%	—	66%	—	95%

It might be argued that the increase in vomiting with increase in duration of anaesthesia is due to the production of slight degrees of anoxia by surgical shock. This may very well be true; but, generally speaking, plastic operative procedures rarely cause any demonstrable degree of shock unless associated with considerable haemorrhage. Care was taken at all times to avoid anoxia, and an adjuvant agent was added or increased in preference to "pushing" the nitrous oxide. Where any factor predisposing to anoxia was suspected the oxygen percentage was increased considerably, and in certain cases, which do not appear in this series, nitrous oxide was omitted altogether.

Child Cases

A most striking contrast to the above is provided by a separate series of 230 endotracheal anaesthesias in children under 10 years of age. The operative procedures, in these cases also, required the lightest of anaesthesia. Premedication consisted of atropine, and children over 2 years of age were given oral seconal or rectal pentothal for basal narcosis. Anaesthesia was maintained with nitrous oxide, oxygen, and minimal ether, delivered to a short side-feed catheter-mount to which was connected a length of corrugated tubing, thus employing Ayres's "T"-tube principle. Vinesthene or cyclopropane was used in most cases to achieve a smooth and rapid induction to a depth desirable for intubation. A high proportion of these patients vomited in the theatre immediately on withdrawal of the anaesthetic, but the figures (Table IV) are based on whether they vomited or not after return to the ward.

Judged on the numbers available, the incidence of vomiting in children does not appear to be significantly altered by the duration of anaesthesia within the range of the periods studied.

TABLE IV.—*Vomiting in Children*

Hours:	Under 1/2	Under 1	Under 2	Over 2
Total cases ..	10	61	143	20
Vomited ..	2 (20%)	22 (36%)	35 (25%)	6 (30%)

These observations immediately suggest a psychological factor in adult vomiting, but it is difficult to conceive how this can be correlated with the duration of operation. The patient cannot know, unless told, how long the operation lasted, and in plastic surgery cases the amount of after-pain would be a most deceptive guide to the length of anaesthesia.

Summary

A series of over 1,000 cases is examined, and evidence is presented which strongly suggests that the incidence of vomiting after light anaesthesia is materially affected by the duration of anaesthesia in adults, but that this does not appear to be true in children.

I should like to express my thanks to the Director-General of the Ministry of Pensions for allowing this publication; and to Prof. Kilner, Director of the Plastic Surgery Unit, for continual encouragement and advice.

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Medical Memoranda

A Case of Blast Injury

An account of this case is placed on record because of its complex clinical character and its significance in relation to other similar cases which may arise.

Blast injuries have been extensively recognized since the Spanish War, and are due to exposure of the effects of big explosions at close range. The clinical findings are well known and require no recapitulation. A more recently recognized type is that met with in sailors who, while in the water, receive the effect of depth charges. Here the lesions are multiple abdominal injuries varying in severity from subserous haemorrhage to rupture of the bowel. The injuries are associated with severe shock and may present the classical signs of a perforated abdominal viscus. The mortality in cases subjected to surgical treatment is exceedingly high, but this in part may be due to the relatively primitive conditions under which after-treatment must be carried out immediately after a naval action. Similar injuries may be met with during landing operations.

The following report of a blast injury presents several very unusual features—in particular a neurological complication which may be the first of its type recorded.

CASE RECORD

The patient was close to a Japanese grenade when it exploded, and he received part of the force of it. He was picked up unconscious, in which condition he remained for about an hour afterwards. On admission to an M.D.S. he was conscious though drowsy. There were several small wounds on the left arm and leg and the left side of the chest, none of which appeared to be in any way serious. They were in fact the "peppered" small lesions very commonly seen. There was in addition a very profound degree of shock, which did not respond to vigorous treatment to any perceptible degree. This was in no manner accounted for by the visible lesions. Nine hours after injury twitching of the shoulder and neck muscles began. It was severe and persistent, but did not spread. Apart from one vomit described as projectile, no new features developed. When seen 24 hours after injury the patient was still profoundly shocked and not complaining of pain in any part of the body. Examination of the nervous system showed no abnormal signs so far as could be ascertained, except the presence of epileptiform attacks of a Jacksonian type. Lumbar puncture gave absolutely clear fluid at 150 mm. pressure.

The immediate problem was to combat shock and stop the epilepsy. Barbiturates very largely achieved the latter, but the former remained, and death occurred about 72 hours after injury. It may be noted that there was no indication for operation on the head, there being no signs of a space-occupying lesion and careful examination of the shaved head revealing no penetrating injury.

The necropsy findings were as follows: *Brain and meninges :*—Careful search revealed no macroscopic abnormality. Attention was paid particularly to the Rolandic area, and neither haemorrhage nor thrombosis could be seen. The C.S.F. was clear and the ventricular system normal. *Abdomen :*—On opening the peritoneum an area of central peritonitis was seen. This was largely walled off by lymph of recent origin. There was a little pus in the central part and some in the right kidney pouch. The cause was sharply localized gangrene of three sections of the terminal loops of the ileum, each about 3 in. long and matted together. There was no perforation of any of this area, but in places all the coats but the mucosa were split. The state of affairs very closely resembled a mesenteric thrombosis, but the vessels were normal. There was no wound on the abdominal wall or any other pathological condition in the abdomen. All other organs were normal, and there was only minimal sepsis around the wound.

COMMENTARY

The diagnosis was obscure from the beginning, and the injury which gave rise to the symptoms did not present a macroscopic lesion at necropsy, while that which was apparent at necropsy and was the immediate cause of death showed no direct signs or symptoms.

When the patient was seen the diagnosis made was multiple grenade injuries and a cerebral blast injury. The profound shock was considered to be the summation of the original shock plus exhaustion caused by the muscular twitching, though on mature consideration these factors did not appear to be sufficient to produce the degree seen, which was remarkable in itself. The further unsuspected abdominal lesion completed the picture. The aetiology of the abdominal injury was undoubtedly blast. The picture is very similar to that seen in naval cases; the affected portions of the gut were in the central part of the abdominal cavity, most exposed to the effects of blast, and there was no penetration of the abdominal or gut wall. The latter feature explains the lack of abdominal symptoms, for peritonitis would develop only as infection penetrated the bowel wall—a fairly gradual process. The fact that no cerebral lesion was demonstrable is not considered to invalidate the diagnosis: the smallest necessary irritative lesion need be no larger than the few Betz cells involved.

The lessons to be learnt from this case are that blast injuries may arise from relatively small explosions, they may be associated with minimal external wounds, and the effects may be multiple. They should be considered when a patient is shocked beyond the degree expected from the superficial injuries, but full and repeated examinations are necessary—an admittedly difficult ideal in battle conditions. This patient was never fit for operative treatment, but similar lesions are by no means beyond the possible scope of the surgeon.

In conclusion a note might be made that a probable abdominal mortar-blast injury was seen by me. Here the patient was very shocked, though with no external injury. Resuscitation was successful, but for four days he had persistent abdominal pain and distension and persistent tachycardia. Recovery took place after four days, during which time he was in a very much poorer condition than the signs appeared to justify.

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Poisoning by Accidental Drinking of Trichlorethylene

Although poisoning by trichlorethylene fumes is not uncommon it is rarely that one meets a case in which the accidental drinking of this industrial solvent takes places. Two cases are reported below.

CASE I

Mrs. H., housewife, aged 29, had had a cold for a few days. At about 6.45 p.m. on Sept. 25, 1944, a neighbour (Mr. M.) suggested she should take a dose of his medicine (R Pot. iodid. gr. 2½, ammon. carb. gr. 2½, chloroform water to 1/2 fl. oz.). She drank about half an ounce.

At 7.20 p.m. I visited Mrs. H. in response to a telephone call. She lay on a couch in a coma. Apparently, immediately she had taken the dose of medicine she spluttered. She complained that the smell of the medicine had "gone to her nose," and she had an acute lacrimation. She was given some water, which she vomited, and sneezed about a dozen times. Her legs had gone weak and she had had to sit down, and there was a hammering in the head. The condition quickly passed into unconsciousness. Just previous to the unconsciousness some whisky had been given to her, but was returned in the vomit.

Physical examination showed her colour to be good, there was shallow breathing, and the pulse was of good volume. The heart sounds appeared normal. The pupils were widely dilated and did not respond to light. The limbs were completely flaccid. Reflexes were equal. At 8.15 p.m. the patient roused a little, vomited, and recognized those around her. The odour of her breath was mainly that of whisky, and she complained of frontal headache. She lapsed into a state of drowsiness again, and remained so on and off all night. She herself subsequently did not remember anything of her rousing, and only at midnight did she realize where she was. Progress continued slowly, the main symptom being a frontal headache, which persisted till Sept. 29. Next day she complained of abdominal pain and heaviness in the right subcostal region. Examination showed that there was slight tenderness over the liver, but no enlargement was discernible. Bowels were open normally and the urine was negative in albumin, sugar, and bile. She recovered completely in 10 days

CASE II

This patient, Mr. M., is a fireclay miner aged 47. At about 6.45 p.m. on Sept. 25, 1944, he took a tablespoonful of his medicine out of the same bottle as he handed to Mrs. H. This left about two doses in the bottle, and he had another "taste," which left the bottle nearly empty. He did not feel any ill effects until about 8.40 p.m., although it was observed, without at the time any particular notice being taken of it, that he stumbled a little when approaching my car at the time Mrs. H. was being visited.

At 8.40 p.m. he complained that he felt drunk, and almost immediately vomited copiously. He was found later by his son some time after 9 p.m. in a dazed, helpless condition, and this was taken to be a bout of alcoholic excess. However, the son on smelling the vomit detected the odour of trichlorethylene. He gave his father salt and water, which produced further vomiting. Mr. M. himself remembered nothing until next morning. He was not seen by me until Sept. 26, when he reported that he still felt "swimmy" in the head and weak in the legs. He had a very dry tongue, but there had been no further sickness. He recovered completely in five days.

COMMENT

It transpired later that the son of Mr. M. had a 10-oz. bottle, containing trichlorethylene for cleaning purposes, similar to that in which the cough mixture was kept, in the same cupboard, the only difference being that the cough medicine had a label giving the directions for taking it and the trichlorethylene bottle

had none. This latter bottle was found to be nearly empty. Both contained at the time of the above events about three or four tablespoonfuls of fluid. It was obvious that Mrs. H. and Mr. M. had between them consumed trichlorethylene in place of the medicine. It is possible that the delayed effect in the case of Mr. M. was related to his accustomed daily consumption of alcohol. He drinks on an average about four pints of beer a day. The bottles, in addition to being of the same size, contained a similar colourless fluid with a similar smell.

Kirkburton, Huddersfield. J. A. STEPHENS, M.R.C.S., L.R.C.P.

A Sporadic Case of Trichiniasis

During the war at least three outbreaks of trichiniasis have been described (Sheldon, 1941; Lee, 1941; Garrod and Maclean, 1941; Davis and Allott, 1941; Bacon, 1941), the cause being traced to eating raw or undercooked sausages. The sporadic case now recorded is interesting in its full clinical and epidemiological features, and also in showing a positive intradermal reaction; for the diagnosis of trichiniasis in man can sometimes be tedious and uncertain, especially in an isolated case.

CASE HISTORY

Mrs. A., aged 36, an evacuee from London, was admitted to hospital on March 9, 1945; the illness started on March 5 as a cold with general aching in the body, and with headache, sweating, and shivering attacks. It was thought to be influenza.

On admission she had pronounced oedema of the face and eyelids, the tongue was furred, the throat clear, but there was generalized tenderness of the muscles. Temperature was 103°, pulse 100, and respiration 24. In the chest and abdomen nothing abnormal was detected, and there was no rigidity of the neck. A scalding and burning sensation was felt on micturition, and menstruation had been irregular. She felt thirsty, but had no appetite, and was very drowsy and mentally confused.

Course of the Illness.—The temperature continued at 100–103° for six days after admission; it then fell by lysis: the oedema of the face and eyelids was severe for three or four days and then gradually cleared. Headache in the occipital and bitemporal regions was marked with buzzing in the head, these symptoms disappearing just before the temperature began to fall; the muscular tenderness also remained for several days. Subungual splinter haemorrhages, often characteristic, were not seen. On March 17 the temperature was normal, there were no symptoms, and appetite was returning; and on March 21 she was discharged to a convalescent home. On March 10 her blood urea was 26 mg. per 100 c.cm. A blood count showed a leucocytosis of 15,000 per c.mm., with eosinophilia of 38%. Urinalysis: Sp. gr. 1018; *p*H 5.0; albumin, trace; sugar or acetone, *nil;* centrifuged deposit, a few leucocytes and an occasional red blood corpuscle; no casts or crystals; culture sterile.

Intradermal Test.—Through the courtesy of the Emergency Public Health Laboratory Service Dr. W. D. H. Stevenson, C.I.E., of the Ministry of Health Government Lymph Establishment, kindly sent two ampoules (0.1 c.cm.) of trichina antigen 1:8000; an intradermal test on March 21 (16th day of illness) was negative. The test was repeated on April 17 (43 days after the illness began), a positive reaction being obtained. Almost immediately after the intradermal injection a wheal came up with definite pseudopodia which looked rather like a small starfish, and within about 10 to 15 minutes a zone of erythema surrounded the wheal; the erythema disappeared after a short time, but the wheal remained for several hours; it was about 10 mm. across. The control showed no reaction.

EPIDEMIOLOGICAL NOTE

Mrs. A. ate sausages twice a week—every Tuesday and Thursday; she herself took them uncooked, spread on bread, while her husband and three children ate them well cooked in the usual way. It appears that her mother was told by a doctor years ago to give her underdone meat because she was delicate, and she says she takes other meat rather underdone. The sausages were bought from a small general store which obtained its supplies from a large firm in the South-West; there had been no other complaints, and it was not possible to incriminate any of the pork or any particular batch of sausages. Thus the incubation period could not be obtained, although it is usually stated to be within 7 to 12 days (Beeson, 1941).

My thanks are due to Dr. G. T. Allerton, honorary physician, Torbay Hospital, for permission to publish these notes; to Dr. J. V. A. Simpson, M.O.H., Torquay, for his help and advice; and to Dr. J. Quinlan for pathological investigations.

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Reviews

THE SCIENCE OF NUTRITION

The Science of Nutrition. By Henry C. Sherman, Mitchill Professor of Chemistry, Columbia University. (Pp. 253. 15s.) London: Oxford University Press. 1944.

This book aims at giving a summary and evaluation of the present status of the science of nutrition and its social importance, with the minimum of technical terms and without any demand for a specific training in science on the part of the reader. At the same time it demands curiosity, and is suited to those who appreciate that science is a changing and expanding structure, based on evidence, and does not consist of a series of *ex cathedra* pronouncements such as are common in many elementary books on nutrition. On the whole the book is highly successful. The author stresses how progress depends on carefully controlled experiments and how it moves from qualitative to quantitative knowledge and thence to further advances. Enough history of the discoveries is given to illustrate the nature and the difficulties of this progress.

If the knowledge that has been gained is to be used for assessing and improving human nutrition we need to know the contributions that various foodstuffs make towards meeting the requirements for various nutrients. This is done in a well-balanced account which gives proper recognition to the value of cereals. Having concluded that the main change needed in American diets is to increase the amounts of fruit and milk, the author discusses different methods by which the public can be educated to make these changes and the national nutrition policy involved in making such changes possible.

The one criticism that can be made of the book is that the outlook throughout is that expressed in the last sentence: "The question, What particular thing does such nutritional improvement do? hardly admits of a more specific answer than that it offers us the option of a more liberal term of years of more efficient life with which to do what we will." Abundant evidence is adduced to show that improved nutrition does offer this prospect to rats. But several studies made during recent years have appeared to show that adult human beings are less susceptible to the ill effects of a defective diet than might be expected from animal experiments. It has proved more difficult than was anticipated to demonstrate, in adults, the chronic suboptimal states (as distinguished from the early stages of gross deficiency) that were looked for. Undoubtedly health improves with improvement of the food supply; but in most cases other relevant factors besides food vary with it. Even experimental improvements of the diet of children whose basic diet was not grossly deficient have not had the effects that were hoped for. Doubtless these experiments have been carried out over too short a fraction of human life to show conspicuous results. But the position is difficult, and ambitious promises, made now to peoples in Britain and the U.S.A. as a whole, may lead to disappointment and scepticism later. There remains, however, no doubt that the poorer sections of the population in these countries—and the population of a great part of the world—would benefit enormously if their diet were improved, and it is on this certain improvement that we should concentrate our energies.

DERMATOLOGY AND SYPHILOLOGY

The 1944 *Year Book of Dermatology and Syphilology.* Edited by Marion B. Sulzberger, M.D. Assistant Editor, Rudolf L. Baer, M.D. (Pp. 544; illustrated. 18s. 6d.) Chicago: The Year Book Publishers; London: H. K. Lewis and Co.

An atmosphere of bellicosity is not supposed to be favourable to the development of medical science, but the editors of this yearbook are of the opinion that military life and the problems of military medicine have given an unusual stimulus to dermatology. There is no doubt of the importance of dermatology in military medicine, for in certain theatres of war skin diseases account for as many as 74% of all men reporting sick, and sometimes as much as 14% of all military ineffectiveness is found to be due to skin disease. As usual the yearbook finds space to mention all the chief items of dermatological progress and observation which have come to light during the year under review, and the utility of the volume is much enhanced

by the "jacket-quiz" printed, as the word implies, on the paper jacket but which would perhaps be better included in the permanent volume. It forms a very searching questionary, and there is no doubt that any dermatologist who can pass the examination paper consisting of the twenty questions included in it may consider himself as extremely well read in the literature of the specialty. The next best thing is for him to study the yearbook with due care.

One of the features of this annual is a special article at the beginning by the editors. This year it is on "scratch tests"—an important method of investigation but very difficult to use with accuracy. This article forms an excellent guide to the subject, which is likely to become of increasing importance. In America it is beginning to be used industrially to test the purity of manufactured articles. For example, in the manufacture of certain paper towels formaldehyde is used. This substance may cause dermatitis. In order to make sure that it has been effectually eliminated from the finished article individuals known to be allergic to it are patch-tested with the towels. Proved free from formaldehyde by this means, this brand of paper towels has been used by millions with impunity over several years.

A very interesting subject well discussed in this volume is the treatment of syphilis by means of penicillin. The editors are of the opinion that this drug is going to revolutionize the therapy of syphilis when the disease is treated in its earlier stages, and that it is of great use in neurosyphilis and congenital syphilis, although they very properly enter a caveat against unrestrained optimism, pointing out that penicillin has not yet been long enough available for the formation of final judgment on its antisyphilitic capabilities.

The 1944 volume of the yearbook is well up to the standard set by its predecessors and should be in every dermatologist's library.

TRAUMA AS A CAUSE OF DISEASE

Trauma in Internal Diseases. With Consideration of Experimental Pathology and Medico-Legal Aspects. By Rudolf A. Stern, M.D. Foreword by Francis Carter Wood, M.D. (Pp. 575. $6.75.) New York: Grune and Stratton.

It falls to the lot of almost every doctor at some time to give legal evidence in a case in which the agency of trauma as a cause of subsequent disease is disputed. Anyone perplexed by this duty will find ample guidance in the work entitled *Trauma in Internal Diseases,* by Rudolf A. Stern of New York, which is based not only on the author's evidently large experience of compensation cases but on a thorough study of the literature: the concluding bibliography contains 2,110 references. Illustrative cases are freely quoted; indeed they occupy more space than the arguments based on them. After a chapter on the general principles by which judgment on traumatic aetiology should be guided, and one on "infectious" diseases, the subject is dealt with regionally; diseases of the circulatory system occupy 164 pages, of the respiratory system 160, and of the alimentary 109. The other principal sections, each rather shorter, are devoted to the kidney, metabolic diseases, the endocrines, and the blood and lymphatic system. Cancer is dismissed briefly, the reader being referred to other extensive reviews of this thorny subject.

To those who have not considered the matter before it will seem astonishing that some of the conditions mentioned—such, for example, as acute yellow atrophy of the liver or Hodgkin's disease—could ever have been supposed to be due to trauma. The author is commended in a preface by Francis Carter Wood for not being dogmatic. He has indeed an open mind, but with a bias in favour of the claimant in the sense that he is reluctant to deny any possibility, however improbable. Merely to base judgment on observation is to place oneself at the mercy of coincidence, and possibly of imperfections in the observation itself. The author accepts published records without question, but among the hundreds which he quotes from all manner of sources there are many about which the sceptic will reserve judgment in the absence of further information. Among the least convincing sections is that dealing with pulmonary tuberculosis, since proof of the non-existence of the disease before injury is plainly impossible. That tooth extraction should not be mentioned as a traumatic cause of subacute bacterial endocarditis is surprising, and the author has old-fashioned ideas about the nature of "surgical" scarlet fever and the source of infection in actinomycosis. He rightly observes that to assess the possible significance of trauma is all the more difficult if the aetiology of the disease itself is unknown: there are 100 recorded cases of supposedly traumatic leukaemia.

Whether the reader regards the deliberate credulity of this book as a fault or not, he will find it an invaluable compendium of information on which to base his own judgment. It is also a textbook of a branch of pathology of great interest, particularly in the more matter-of-fact aspects of its subject, such as the extraordinary nature and diversity of internal injuries which may result from violence without penetration.

SINGING AND BREATHING

The Singing of John Braham. By John Mewburn Levien. (Pp. 40; illustrated. 7s. 6d.) London: Novello and Co.

Mr. J. M. Levien, a distinguished teacher of singing, has written a short account of John Braham (1774–1856), who during the first half of the nineteenth century was the leading tenor singer, in which position he preceded Sims Reeves. He made his first appearance at Covent Garden in 1787, and had become famous already before the end of the eighteenth century. His name is now little known to the public, though for many years he kept the position which he had attained so early, and it is evident that as a singer he was unique and without a serious rival. It is recorded that he possessed a compass of twenty notes, and had such a command of *portamento* that he could pass through the whole range by semitones with great rapidity, each note and the joining thread of tone being perfect, so that no break was perceptible when he passed from tenor to falsetto. It is of interest to remark here that the slow-motion film of the cords made by the Bell Telephone Company for Dr. Pressman shows how different is the mechanism of the shortened cords in the falsetto from the movements in the tenor, the difference being clearly defined by the slowing down on the great scale of 1-250—a belated tribute to the power and capacity of Braham.

Mr. Levien has included in this memoir a chapter by Dr. George Cathcart entitled "A Scientific Justification of the Historic Method of Voice Production." In this Dr. Cathcart extols the Italian method of voice production, and challenges the modern fashion of abdominal breathing. He remains a confirmed and unrepentant advocate of thoracic breathing and the art of *bel canto.* The fact is that great singers breathe as Nature prompts them and are not influenced by any deliberate system of breathing; but the considerations which Dr. Cathcart enumerates have a sound physiological basis, though apparently they are not acceptable to most modern teachers. Braham, at all events, was a conspicuously successful exponent of thoracic breathing. The memoir is embellished by several most pleasing illustrations.

Notes on Books

Virtus Diseases in Man, Animal and Plant, by GUSTAV SEIFFERT, is an attempt to give an interim survey of the status of virus investigation covering the major research work done since 1933. It is translated by Marion Lee Taylor, Ph.D., and published at the price of $5.00 by the Philosophical Library, 15, East 40th Street, New York, under the auspices of the National Research Council of the U.S.A. The author's aim was to guide those who need closer acquaintance with the literature on the virus problem. His purpose being to provide an introduction to the subject as well as a key to published reports, a chapter on working methods of investigation has been added. The bibliographical references appear seriatim as footnotes to the pages. which number 332, including a brief index.

The Lady Gowrie Child Centres were planned by the Commonwealth Department of Health in Australia to study the health, growth, and development of groups of pre-school children. In six large cities a uniform programme of investigation was carried out, and although it was to some extent interrupted by the war, it has been possible to collect and analyse much of the routine data on such matters as physical defects, nutritional states, posture, and causes of absenteeism. Dr. F. W. Clements and Miss Margaret Macpherson, of the Australian Institute of Anatomy, are responsible for *The Health Record* issued at Canberra by the Commonwealth Government Printer, and this is a publication of great value for all workers in the field of child health.

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FROM WAR TO PEACE

The tremendous happenings of the past week or two call for little commentary in a professional journal whose readers must be full-fed with the news and its implications, both by what they see in the lay newspapers and by what they hear from their radio sets. British medicine has played its part with courage and endurance and has achieved much in many fields of war work. Our profession now shares the general feeling of relief and gratitude, but knows well that the end of hostilities can bring no respite from the task of succouring a torn and distracted world. The months and years ahead call for renewed efforts and for clear thinking by medical men and women, upon whose energy of mind and body the war has levied incessant toll. Hard-pressed as they are, they will rise to this demand in the spirit that has actuated them since 1938. Our profession has suffered many losses in the service of the country, and only a part of these is visible in the official casualty lists. British medicine looks backwards over the seven years with pride for what it has done, and forwards into an unpredictable future with sober determination.

On Nov. 16, 1918, there appeared in these columns, under the heading "The End Crowns All," a leader written on Armistice Day by a master hand. It expressed, in a few words well fitted to the occasion, a number of ideas that were latent in the minds of thoughtful people who had watched that war through medical eyes. It foresaw the heavy tasks that lay ahead but not the ruin of our hopes of lasting peace. Disillusionment came slowly. Within 21 years we were engulfed in another and a far worse "war to end war" which has stretched our profession to the utmost of its powers. Let us pray now in quiet mood that *Finis coronat opus* will prove a truer epitaph this time, and that peace on earth has come to stay for more than a generation. Publicists are saying day by day that if the atomic bomb does not abolish war it will bring civilization down in ashes.

SYRINGES AND SPIRIT

"Supposedly sterile syringes," as they were referred to in an editorial in this *Journal* some years ago, used for the injection of medicaments or immunizing agents, have on many occasions transmitted more or less serious infections. When such disasters occur they are usually attributable to faults in the technique of sterilizing or handling the syringe, and it is well known that methods in common use, although they rarely lead to any serious trouble, are imperfect and involve an element of danger, however slight. There is also much doubt and misconception about the efficacy of different methods of sterilizing syringes. A committee of the Medical Research Council has now produced a memorandum[1] on this subject entitled "The Sterilization, Use, and Care of Syringes." As its title implies, the treatment of the subject is comprehensive: measures to ensure sterility are the principal theme, but there are also sections on the choice of syringes and needles, the care and sharpening of needles, a method of testing syringes for leakage, the organization of a clinic for mass inoculations, and the precautions necessary in employing syringes for certain special purposes, such as tuberculin tests, the withdrawal of blood for antitoxin estimations, and mass intravenous injections.

The first and most emphatic injunction is that syringes used for aspirating septic material or any possibly infected body fluid must never be diverted to an aseptic purpose, such as the injection of a sterile medicament. This is an elementary precaution, the neglect of which caused one of the notorious disasters of recent years. The clue to the efficient use of syringes is to have enough of them, and to have separate ones for these different jobs is the duty of every practitioner. It is then urged that, as there is no known method which can absolutely be depended on to sterilize a syringe except autoclaving or exposure to a temperature of 160° C. in a dry oven, one of these methods should preferably be employed. This is to sound the death-knell of the Record syringe, since the cement at the glass–metal junctions is liable to melt at these temperatures. The memorandum does in fact strongly advocate the universal substitution for the glass–metal syringe of a two-piece all-glass syringe, and refers to a British Standard Specification for such a syringe [B.S. 1263 (1945)] which is now available. The all-glass syringe has another important advantage in being much more easily cleaned; it should have no obscure crevices in which traces of its previous contents may lurk. The ideal policy is undoubtedly to have plenty of such syringes, to encase them in glass tubes, and sterilize them by dry heat. Under the heading of "A Syringe Service for a Hospital" it is advocated that in a large hospital a single department should have the care of all the syringes, cleaning, sterilizing them by this method, and re-issuing them to all wards and other users; it is mentioned that this service has existed in one hospital for some years and worked well. Boiling is given as a second-best alternative; it will not kill sporogenous bacteria unless sodium carbonate is added to the water, "but this practice is not recommended because the resulting alkalinity of the syringe may affect drugs or biological products to be injected." Admittedly the risk of infection by sporogenous bacteria is remote compared with that by pyogenic cocci, but it exists; and both for this reason and because a dry syringe is preferable to a wet one the method is not ideal. The hot-oil method was tested and found to be ineffective.

In order to decide whether any chemical method of sterilizing a syringe is feasible members of the committee found it necessary to supplement existing knowledge by performing *ad hoc* experiments. Their findings are that hypochlorites, phenols, chlorophenols, quaternary ammonium salts, and detergents are "ineffective as disinfectants for syringes, and may damage the material to be injected." The main reason for their inefficacy is evidently that "they cannot be guaranteed to penetrate into the crevices and

[1] M.R.C. War Memo. No. 15. H.M. Stationery Office, 1945. Price 4d.

corners of a syringe in which bacteria may lodge," for the only chemical disinfectant receiving even a qualified recommendation is 70–75% V/V alcohol; and, although this sterilized a two-piece all-glass syringe when it was taken apart, it did not sterilize a glass–metal (Record) syringe under any conditions. It is therefore recommended that the disinfection by spirit should be confined to syringes employed for and by a single patient for the injection of insulin or adrenaline. Many experiments, briefly described in an appendix, were made with spirit, syringes themselves and various other infected test objects being used before this conclusion was reached. This appendix also gives a concise but comprehensive review of what is known about the disinfectant action of alcohol, and of infections caused by injections made with syringes which spirit had failed to sterilize: these include numerous reports, mainly Continental, of cases of gas gangrene. Reference to this appendix should provide the answer to many questions which have been asked about the suitability of spirit for various types of disinfection. The salient points are that alcohol acts best in a concentration of 75% by volume in water, and scarcely at all when undiluted; that it acts only on vegetative bacteria; that it has little power of penetration; and that in general it is a better disinfectant than most for skin but an unreliable one where absolute sterility is necessary, as for instruments.

Further original observations on the disinfectant action of alcohol were reported in the Aug. 4 issue by G. T. L. Archer, with particular reference to its use on the skin. His findings, with six different methods, conform in general to those of previous workers. One interesting point well brought out here which should not be overlooked is that when the skin is moist—and this applies particularly to use in hot climates—undiluted alcohol is effective, and the concentration used should be not less than 80%, owing to dilution with sweat. Archer also studied the disinfectant action of ether on the skin, and found it ineffective, presumably owing partly to the rapidity of its evaporation. Ether is apparently also more active against bacilli of some species than against cocci. There is perhaps something yet to be learned even about the commonest of all everyday acts of disinfection—that of the normal skin preparatory to an injection.

VACCINATION AGAINST WHOOPING-COUGH

The protective effect of bacterial vaccines is notoriously difficult to assess. There is not one of which we can say with confidence that under such and such conditions it will have a given effect on the morbidity or mortality rate. On the whole it looks as if inoculation was of greater value against diseases, like enteric fever and plague, in which there is an invasion of the body tissues affecting particularly the reticulo-endothelial system, than against those, like dysentery and cholera, in which the organisms remain confined to a mucous surface. If this is true of the intestinal diseases it is still more so of the bacterial infections of the respiratory tract. Several attempts on a big scale to vaccinate against pneumonia and meningococcal infection have proved a failure or have yielded inconclusive results. The single exception for which success has been claimed is whooping-cough, and it is therefore all the more necessary to look with care into the credentials of pertussis vaccine.

The early attempts, from 1915 onwards, to vaccinate against whooping-cough were reported on very favourably. When, however, they were repeated, with the inclusion of a non-vaccinated control group, serious doubt arose as to the value of the method, deepening with further trials into almost complete scepticism. Leslie and Gardner's discovery[1] of the phasic variation of *H. pertussis*, and their insistence on the use of Phase 1 organisms alone for preparing vaccine, provided a plausible explanation for the failure of vaccines that had hitherto been made from old rough strains, and pointed the way to a more hopeful approach in the future. Reports on the success of the new vaccine were not long in forthcoming. Madsen,[2] Sauer,[3] Kendrick,[4] and Bell,[5] among others, each carried out large-scale trials which seemed to show that the attack rate was greatly lowered, and that when the disease was not prevented it was rendered very much milder. With such testimonials behind it, pertussis vaccine was accepted with acclamation and took its place, along with diphtheria prophylactic, in the routine preventive measures employed in clinics and children's institutions. Are we really confident, however, about its value? Have the conditions of the apparently successful trials been above criticism? And is there complete unanimity on the fact, if not on the degree, of protection? These are questions that must be answered before pertussis vaccine, like diphtheria alum-precipitated toxoid, receives the full sanction of the Ministry of Health and is issued free to all. Let us take the last question first. There have been reports, both in this country and in the United States, of complete or almost complete failure to protect against whooping-cough by use of the vaccine. Two of the most striking are those by Doull and his colleagues[6] in Cleveland, Ohio, and by Siegel and Goldberger[7] in New York. Doull, whose observations were made at child health centres, took particular care to avoid the numerous pitfalls that attend trials carried out in a clinic population; and Siegel and Goldberger avoided them almost completely by working in an institution where the children were living under similar conditions and were exposed to similar risks of infection. The same cannot be said of many of the apparently successful trials. The great difficulty in clinic investigation is to secure virtually identical conditions in all important respects of the inoculated and the control groups. Special attention has to be paid to the general intelligence and co-operativeness of the mothers; the housing and social conditions under which the children live; the size of the family; the occurrence of previous cases in the family; the frequency, degree, and time of exposure to the risk of infection; and the care with which the children are followed up. None of the four observers we have mentioned who reported favourably on pertussis vaccine appears to have conformed entirely to the necessary requirements. Sauer never had a proper control group; Madsen says practically nothing

1 Leslie, P. H., and Gardner, A. D., *J. Hyg.*, Camb., 1931, **31**, 423.
2 Madsen, T., *J. Amer. med. Ass.*, 1933, **101**, 187.
3 Sauer, L. W., *Amer. J. publ. Hlth.*, 1935, **11**, 1226.
4 Kendrick, P. L., *Amer. J. Hyg.*, 1943, **38**, 193.
5 Bell, J. A., *Publ. Hlth. Rep. Wash.*, 1941, **56**, 1535.
6 Doull, J. A., Shibley, G. S., Haskin, G. E., Bancroft, H., McClelland, J. E., and Hoelscher, H., *Amer. J. Dis. Child.*, 1939, **58**, 691.
7 Siegel, M., and Goldberger, E. W., *J. Amer. med. Ass.*, 1937, **109**, 1088.

about his two groups except that they were unselected and were comparable in respect of age, time of epidemic, and surrounding conditions; Kendrick's groups differed in the average size of the family, in the frequency of exposure to infection, and in previous history of whooping-cough; and Bell's observations on his two groups were apparently not started at the same time. That misleading results may follow neglect of these factors is brought out clearly by the experience of B.C.G. vaccination in New York. When vaccine was given to the infants of mothers who accepted the offer, and the infants of mothers who refused were treated as controls, the results of vaccination were favourable. When, however, the element of selection was eliminated by vaccinating infants in alternate rotation, no difference between the vaccinated and control groups was observed.[8]

The paper on page 205 by Drs. McFarlan, Topley, and Fisher raises once again the issue of pertussis vaccine. In their earlier investigation McFarlan and Topley[9] restricted their observations to children in residential nurseries, where almost perfect equalization between the two groups could be assured. In their present investigation they included a clinic population as well, taking care to avoid so far as possible the errors to which we have just alluded. In neither investigation did they obtain evidence that pertussis vaccine had any effect on the attack rate or on the severity of the disease. What is the explanation of these results? Their first investigation was criticized on the ground that the dose they were using was too small, but a comparative study has since shown that, as the English vaccine contains approximately three times as many organisms as American vaccine of the same labelled strength, this objection cannot be upheld. Another criticism that might be made is the same as that which was levelled against Doull's work—namely, that the vaccine used was prepared from washed organisms, the toxin of which had been removed. It is doubtful how much force there is in this objection. Considering that the toxin of *H. pertussis* is very labile and is apparently absent from Sauer's vaccine; that there appears to be no cross-immunity between whooping-cough due to *H. pertussis* and that due to *H. parapertussis*, which share the same toxin but which differ antigenically; and that the toxin is said by Flosdorf, Bondi, and Dozois[10] to be non-antigenic in human beings—it may well be questioned whether the protective effect of pertussis vaccine can be related to its toxin content. One thing is clear: before steps are taken officially or unofficially to extend the practice of vaccination against whooping-cough further observations must be carried out under the most carefully controlled conditions to determine the value of this procedure. It is comforting to learn that an investigation is at present in progress at Oxford in which Sauer's vaccine, obtained directly from the United States, is being submitted to trial. Unless the results are more favourable than those hitherto obtained with vaccines of British manufacture it will be all the more necessary to pause before countenancing a practice which, when once established, will take many years to abolish.

[8] Levine, M. I., Vogel, P., and Rosenberg, H. A., *Amer. Rev. Tuberc.*, 1938, **38**, 632.
[9] McFarlan, A. M., and Topley, E., *Mon. Bull. Min. Hlth., Lond.*, 1943, **2**, 122.
[10] Flosdorf, E. W., Bondi, A., and Dozois, T. F., *J. Immunol.*, 1941, **42**, 133.

LYMPHOCYTES AND ANTIBODIES

Some interesting evidence has recently been obtained suggesting that the lymphocyte is intimately concerned in antibody formation. W. E. Ehrich and T. N. Harris[11] showed that when an antigen is injected into the pad of a rabbit's foot antibody appears in the efferent lymphatic draining the popliteal lymph node; this node undergoes marked hyperplasia, increasing five times or more in size, and the lymph from it contains large numbers of lymphocytes. That these cells actually form the antibody seems to have been proved beyond doubt by T. N. Harris, Grimm, E. Mertens, and W. E. Ehrich,[12] using the same elegant and delicate technique. They collected lymph from the efferent lymphatic five to seven days after the injection of foreign red cells or typhoid vaccine into the foot, separated the cells from the plasma, extracted the former by freezing, and compared the antibody content of plasma and cell extract. The result of this difficult proceeding—difficult owing to the very small quantities of material available—was to show that the cells usually contained from four to eight times as much antibody by volume as the plasma. To verify the proposition that these lymphocytes had formed the antibody it had to be shown that they do not absorb it. Lymphocytes containing sheep's cell agglutinin were therefore suspended for 24 hours in plasma containing typhoid agglutinin. When plasma and an extract of the cells were tested later it was found that the cells had given up some of their antibody to the plasma but absorbed none of the different antibody contained in this, nor had the titre of the plasma antibody fallen. In order to clinch this argument by substituting *in vivo* for *in vitro* conditions anti-erythrocyte serum was injected into a popliteal lymph node previously immunized with typhoid bacilli, the efferent lymphatic being ligatured in order to prevent its escape. Five hours later lymph was obtained from it and tested as before; the injected antibody was found in high concentration in the plasma only, the amount in the cell extract being usually much lower, and only such as would be expected from the traces of plasma in the cell deposit from which the extract was made.

That lymphocytes liberate antibodies appears to have been shown by another type of experiment, which incidentally throws light on another phenomenon—the anamnestic reaction. T. F. Dougherty, Jeanne H. Chase, and A. White[13] claim to have shown previously that increased adrenal cortical secretion accelerates the release of antibody from the lymphoid tissue of immunized rabbits, and that this result is due to the dissolution of lymphocytes, of which there is evidence, both histological and in the form of a lymphopenia. Further to support this proposition, they immunized rabbits and mice against sheep's red cells, waited some months until antibody was no longer demonstrable in their serum, and then gave a single dose of adrenal cortical extract or pituitary adrenotrophic hormone. Within a few hours a high titre of antibody to sheep's cells was reached in the blood. In adrenalectomized mice this effect was not produced. This anamnestic reaction also followed injections of potassium arsenite or benzene—substances which, according to these authors, also stimulate the adrenal cortex and cause lymphocyte dissolution and lymphopenia. The subject has been approached from another point of view by E. H. Kass,[14] using human material. Arguing that if lymphocytes are a source of antibody globulins they should normally contain γ globulin, he devised a

[11] *J. exp. Med.*, 1942, **76**, 335.
[12] Ibid., 1945, **81**, 73.
[13] *Proc. Soc. exp. Biol.*, N.Y., 1945, **58**, 135.
[14] *Science*, 1945, **101**, 337.

method of determining whether this is so. An antibody to pure human γ globulin was obtained by immunizing rabbits, and tested against an extract of normal human lymphocytes obtained from mesenteric lymph nodes and freed entirely by washing from serum proteins. Not only did these react, but the cell extract absorbed antibody from the serum, and extracts of other tissues did not react with it. All these interesting studies point conclusively to the lymphocyte as the source of antibody, but it should be remembered that some years ago Florence Sabin,[15] using a most ingenious and striking method of observation, obtained evidence that antibody is formed by macrophages, or "clasmatocytes" as they were once called from their habit of shedding fragments of cytoplasm—this being the process by which, according to Sabin, antibody is released.

SALICYLATE AND PANTOTHENATE

Much has been heard during recent years of the antagonism between sulphanilamide and its analogue *p*-aminobenzoic acid, and of the similar one between pantothenate and the related compound pantoyltaurine. It has generally been considered that the drug (sulphanilamide) blocks combination of an enzyme with *p*-aminobenzoic acid, and that pantoyltaurine blocks a combination of the same type with pantothenate. Attention has been drawn by Ivánovics[16] to a superficially similar antagonism between pantothenate and salicylic acid. Briefly, he has found that salicylate, even in dilution as high as M/1,000, will prevent the growth of bacteria which synthesize pantothenate—e.g., *Staph. aureus* and *Bact. coli*. If pantothenate is added to the cultures the antibacterial action of the salicylate is destroyed, there being a rough quantitative relation between the concentrations of the two compounds concerned in the reaction. When salicylate is added to cultures of some organism which does not produce pantothenate—e.g., *Proteus morgani*—salicylate does not prevent growth (until the concentration is as high as M/40), and the addition of pantothenic acid causes no increase of growth. It is concluded that salicylate interrupts some vital chain of chemical reactions which eventually leads in staphylococci and in *Bact. coli* to the synthesis of pantothenate. This antagonism is accordingly somewhat different from the classical antagonism between sulphanilamide and *p*-aminobenzoic acid.

The main interest of this investigation concerns the biochemist, but the clinician may well consider it in case it provides an explanation to the vexed question of how and why salicylate allays the swelling of the joints and other symptoms which appear in acute rheumatic fever. At present there is no evidence on this subject, nor is it easy to propound a plausible hypothesis to explain this problem of rheumatic fever. The best way of studying it would be to undertake a small clinical experiment. Two groups of patients suffering from acute rheumatic fever would be formed by selecting alternate patients. One group (the control group) would receive the standard course of treatment with salicylate. The other group would be given the same course of salicylate plus large regular doses of pantothenate. If the antagonism between salicylate and pantothenate which occurs with bacteria occurs also in man, it would be expected that the pantothenate would abolish the therapeutic action of salicylate. Such a demonstration would have no immediate clinical application, but it might prove an important starting-point for the further investigation of rheumatic fever. If pantothenate had no effect on the therapeutic action of salicylate, then one would have to conclude that pantothenate played no significant part in the production of the signs and symptoms of acute rheumatic fever.

[15] *J. exp. Med.*, 1939, **70**, 67.
[16] *Hoppe-Seyl. Z.*, 1942, **255**, 33.

VITAMIN K IN URTICARIA

Urticaria is the result of a sudden extravasation of fluid from the capillaries, and it may result from diverse causes. In Becker and Obermayer's[1] classification the first group comprises localized urticaria caused by external irritants such as the sting of insects or the nettle after which the disease is named. The second group comprises urticaria produced locally in response to the action of heat, light, or cold, or as a result of trauma. The third group comprises urticaria of internal origin produced by substances which reach the skin via the blood stream, such as foods, medicaments, inhaled allergens, or bacterial products from septic foci. The final and largest group is ascribed to "nervous exhaustion" or emotional upsets. The emotional urticarias are closely related to the second group or physical allergies, in which the patient is hypersusceptible to physical agencies such as cold. Some of the phenomena in urticaria have been closely studied by Sir Thomas Lewis and his pupils,[2] who have related the wheals to the stimulation of cholinergic nerves and the release of H-substance. Treatment has hitherto been mainly concerned with the removal or neutralization of the mental or physical stimuli believed to provoke the attacks.

A quite different approach has been made by Black,[3] who was stimulated by Howell's[4] suggestion that prothrombin and fibrinogen are constantly being formed and consumed in the blood, probably forming fibrin which in some way provides nourishment or protection for the cells of the capillary walls. Black was thus led to study the prothrombin content of the blood in urticaria and the therapeutic action of vitamin K. The study was confined to 156 patients in whom the disease was chronic and who had not obtained relief from trial diets, search for infections and allergens, or avoidance of drugs. These chronic cases represented just over half of all the patients with urticaria seen during the period of study. A diminished level of prothrombin was found in 65% of the patients. In some instances the diminution was notable, as the prothrombin times were twice as long as normal. It is a pity that the results were not presented in statistical form. Treatment was carried out with vitamin K by mouth, in the form of menaphthone, *B.P.*, 2 mg. thrice daily before meals. The addition of bile salts was found to be unnecessary. Relief was obtained in more than 60% of cases. It occurred most frequently in those patients in whom the coagulation time was prolonged. The duration of treatment varied from one to four weeks, and in many instances lesions ceased to appear after two days of treatment. Relapses occurred in about one-third of the patients, but the patients were again relieved by administration of the vitamin. These are considerable claims to make for a new and simple treatment for chronic urticaria, and it will be interesting to discover whether others have the same success as Black.

The Central Medical War Committee is informed by the Director-General, Army Medical Services, that instructions have now been issued for the release of medical officers in Groups 12 to 16 to be effected before the middle of October.

[1] *Modern Dermatology and Syphilology*, 1943, Philadelphia.
[2] *Clin. Sci.*, 1942, **4**, 365; 1944, **5**, 5.
[3] *J. Allergy*, 1945, **16**, 83.
[4] *J. Amer. med. Ass.*, 1941, **117**, 1059.

"ORTHOPAEDIC" REHABILITATION

BY

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Function in the human body is dependent on use. If a limb is not used it withers. By immobilizing a part of the body in the treatment of a skeletal injury we are inviting it to wither. We now realize that loss of function during immobilization can be minimized and ultimate recovery speeded to completion by supervised active exercise. The first objective therefore is *maintenance*. Muscle-wasting and loss of blood supply in immobilized joints must be kept to a minimum during the fixation period by regular active muscular exercise. The second objective, which emerges when fixation is removed, is *restoration of function* by redeveloping power, mobility, and co-ordination in the injured part. Experience has shown that, generally speaking, the redevelopment of muscular power is the most important of the three. Muscle fibres obey the "all or none law"; to ensure, therefore, that every fibre is brought into play exercises should be performed with the maximum of effort, well sustained, and followed by a period of relaxation. Thus with a leg in plaster light movements of the toes are a waste of time. The toes must regularly be tightly flexed and vigorously extended.

For the patient in bed the simplest exercises suffice, but they must be supervised. The responsibility for seeing that they are carried out rests with the ward sister, but it has been found satisfactory to train a nurse in each ward to teach and supervise the exercises and see that they are carried out regularly. Five minutes every hour, at the hour, is the ideal. In the ambulant stage, when function is more advanced and the exercises become more complex, they can best be supervised by a P. and R.T. instructor, particularly as much of the work is done in groups or classes.

The physiotherapist is also concerned principally with active exercises, and his roles are "facilitation" and "re-education." "Facilitation" implies the treatment of the inhibitory factors of pain and stiffness. In this connexion the paraffin-wax bath has been found very satisfactory. "Re-education" embraces the treatment of weak muscles in all types of disability, from the flicker of recovery after paralysis to temporary inhibition by operation. Special apparatus is not essential for this, but some form of frame for the suspension of the affected limb in slings is useful; for, in a limb so suspended, gravity and the muscles needed to counter it are eliminated, allowing even the weakest muscles to produce movement (Guthrie-Smith, 1944). The exercises *must* be progressively graded up in power and duration as the muscle recovers, to ensure that the patient doesn't get the chance to use sling suspension as a convenient form of rest cure. The frame is also useful for the attachment of helical springs for resisted exercises.

Occupation is the ideal method of restoring mobility and co-ordination, and is especially applicable to wrist and hand injuries, but in spite of ingenious adaptations (Colson, 1944) its contribution to the redevelopment of muscular power is not comparable to that of active exercises. The diversional forms of occupation are invaluable for maintaining the patient's interest and morale, particularly when he is in bed. After he gets up, and before he is fit for a full day's rehabilitation programme, the remedial forms of occupational therapy can well be interspersed between prescribed exercise periods.

The following notes are based on experience at a Royal Naval hospital and its annexed orthopaedic rehabilitation centre.

The Shoulder and Upper Limbs

For the *shoulder*, mobility is as important as power. Full elevation is almost impossible in the absence of external rotation. The patient's active efforts in this direction (the elbow being flexed), both with the arm at the side and with it abducted, are necessary throughout treatment. While the arm is still in a sling, exercises are confined to deltoid bracing and easy external rotation movements. When the sling is first discarded, the resistance of gravity is diminished by doing rotary and swinging exercises in a stooping position and by exercising in sling suspension. Resistance is gradually introduced—in the former by increasing the amplitude of movement, and in the latter by varying the point of suspension and using springs. Once the arm can be abducted to the right-angle against gravity, special apparatus can be dispensed with, and nothing more complex than balls and broomsticks is needed to lend variety to the exercise routines. The good arm, which should be exercised with the injured one from the start, is used both to assist the movement of the latter and to redevelop power by resisting it. As function improves, increasing attention is paid to overhead work in exercises and in games. Most such games are the fruit of the instructor's invention, but volley-ball is both remedial and popular. The tendency to spare the injured arm is countered by employing two-handed games whenever possible. Heavy bouncing balls provide excellent shoulder exercise, particularly in the later stages, for they encourage increased mobility by "impulsive action," as advocated by Mr. Ernest Griffiths (1943). Rhythmic arm-swinging exercises have a place in the early treatment of stiff shoulders, but later are mainly used as a form of respite between spells of hard muscular work.

The *elbow-joint* is very slow to recover its mobility. Mobility is achieved by *active* movement only—i.e., by the contractions of biceps and brachialis or triceps. These efforts must be purposeful, and be persisted in at frequent intervals throughout the day. Any attempt at passive stretching sets up a vicious circle of strain, tissue effusion, and organization, resulting in diminution of elbow mobility. Mobility at the radio-ulnar joints is achieved by good orthopaedics rather than by late rehabilitation. In the treatment of stiff elbows the aim is so to develop muscular power as to minimize the risk of further elbow strain, and to return the patient to duty, with the encouragement that, if he works at it *actively*, mobility will continue to improve slowly even over many months. Power is developed first by the active efforts to regain mobility and later by resisted exercises within the existing range of mobility. The best resistance is the patient's other hand, but press-ups and pull-ups, starting with the body nearly vertical and the arms horizontal, using any convenient furniture, can be performed under supervision provided that the elbow is *never* strained beyond its existing range by the resisting force. Rotation of the forearm can be resisted by the patient's other hand, but Mennell's "wrist roller" is a useful adjunct.

In the absence of muscle or tendon adhesions in the forearm, gripping exercises, small-ball games, and simple manual work are usually sufficient to restore function in a stiff *wrist*, but the painful wrist taxes the skill and patience of the physiotherapist to the utmost. Broadly speaking, the treatment consists in supervised active movements by each muscle or muscle group in turn, combined with palliation, in the form of heat, for the pain.

Stiff *fingers* are very slow to regain mobility, but the stiffness does respond to active exercises, and contractures may often be reduced by elastic traction. These conditions are easier to prevent than to cure, and the problem is therefore one of orthopaedics rather than rehabilitation. Any fingers that do not have to be fixed should be not only moved but *used*. For exercises each stiff joint must be isolated in turn by an assistant or by the patient's other hand, and the maximum effort made to flex and extend it. These exercises should be preceded by a soaking in very hot water, or, better, in a paraffin-wax bath, though caution must be observed with anaesthetic hands. For the thumb, opposition is the most important movement, and persistent attempts must be made by the patient to oppose it to each finger-tip in turn. Simple games with a tennis-ball, such as spinning and bouncing it against a wall, help to mobilize stiff hands. (The uninjured hand should not be used.) Occupation is the ideal treatment provided the hand be kept warm. Occupational therapy provides a wide variety of graded movements for stiff hands and finds in them its best application, but there is a tendency among occupational therapists to expect too skilful work of stiff hands, and in the earlier stages simple manual work is the best treatment, tool-handles being padded if necessary.

The Lower Limbs

A strong and mobile *foot* is essential to full recovery in any lower-limb injury. If foot exercises are neglected the results are not immediately apparent, but at a later stage of recovery some trivial injury is apt to set up a condition of foot-strain, necessitating a slowing down of activity at the very moment when it should be stepped up to the maximum. Foot exercises, particularly inversion and toe flexion, must be performed regularly and with maximum effort throughout the recumbent and early weight-bearing stages of treatment. Only the latter can be done in plaster, but the effort of inversion should still be made. If these exercises, dull though they be, are well performed the subsequent recovery of ankle movement and control of oedema are greatly accelerated.

Some degree of stiffness and weakness of the *ankle* is inevitable after the use of leg plasters. Oedema is the most potent cause of their persistence. This requires complete control from the start, and crêpe bandaging is rarely adequate. A bandage of Unna's type is needed. This must extend from the toes to the tibial tubercle and exert firm pressure below the malleoli. Formal ankle exercises have a place in the early mobilization stage, but as soon as limited weight-bearing is allowed they are replaced by any exercises that the instructor can devise to redevelop the feeling of spring in the foot and ankle. Backward springing is easier than forward, as less ankle

movement is required, and this should be attempted first: it should be combined with backward bracing of the knee. Springy walking is next introduced, using the arms freely for extra momentum in the spring. Other suitable exercises that can be worked in are "shadow-boxing" and "running starts" against the wall. Activity is the keynote of the later stages. Games such as volley-ball can be introduced early, and cycling is also of great value provided the toe and not the heel is placed on the pedal. Ballroom dancing is another good exercise, and does much to restore the patient's confidence in his leg. The timing of progress is very important in these cases and can only be learnt from experience. It does not pay to get them on to a routine of unrestricted weight-bearing too soon, but if the foundations of a strong and mobile foot are well laid any remaining ankle stiffness and weakness usually recover quickly in the later, "activity" stages of treatment.

The shape of the articular surfaces of the *knee* makes no contribution to its stability, and the ligaments, though very strong, are insufficient to resist even the normal strains of activity; the stability of the knee therefore depends on the power of the thigh muscles. The hamstrings probably make some contribution, but it is principally the quadriceps femoris that embraces and stabilizes the knee-joint. Wasting occurs in this muscle after injury to the joint, and the component that is first to waste and last to recover is the vastus internus. The muscle fibres of this extend almost down to the knee-joint, and it comes fully into play only in the last 10° of extension. Some degree of disuse-wasting after above-knee plasters is therefore inevitable. Quadriceps exercises are essential to recovery from any knee injury or operation. Some patients experience difficulty in bracing the quadriceps of even a normal knee, and if meniscectomy is contemplated the knack of quadriceps bracing must be learnt *before* operation. After operation or injury quadriceps exercises are started as soon as possible, even on the same evening, and are continued hourly throughout the ensuing days. The power of active contraction usually returns quickly, though the vastus internus rarely recovers within 48 hours. The best way to bring it into action is to brace the knee back at the same time as the foot is strongly dorsiflexed and inverted. Straight leg raising is a good exercise, provided the leg is held absolutely straight by quadriceps bracing, but it is painful in the early stages, and there need be no hurry to start it provided bracing is well performed. The recently operated knee is intolerant of weight-bearing, and the 14th day is quite soon enough for the average patient to start getting up, knee flexion having been permitted for the previous two days. Three weeks is early enough to start deliberate knee flexion and hamstring exercises, though static cycles with light resistance may be used sooner. When the patient is able to get up all day the hourly exercise routine becomes impracticable, but exercises can be performed for longer periods at less frequent intervals (20 minutes, 3 or 4 times a day). These are at first done sitting or lying down, but as muscle power returns light weight-bearing exercises are begun under a P. and R.T. instructor, though the emphasis is still on quadriceps exercises. Finally the patient progresses to an active P.T. class, in which he learns to run and jump. In the majority of cases full confidence is regained by the sixth week, though it takes some two or three months for the knee to feel quite normal again.

The stiff "femur knee" is a different problem. Here we are dealing with a "quiet" joint which will tolerate a fair amount of passive straining provided that the strain is applied only by the patient's own efforts. At the same time it is almost invariable to find the patella bound down to the femur. The patella normally mobilizes slowly with daily passive manipulation after heat treatment. Manipulation of the knee under anaesthesia may be needed in selected cases. The static cycles with adjustable pedals are particularly useful in this type of case. Here again quadriceps maintenance and redevelopment are of prime importance. Two useful indices of adequate quadriceps recovery are the ability to maintain a straight knee against a pull of 40 lb., measured by a spring balance applied at the ankle, and the ability to run a zig-zag or figure-of-eight course without pain in the knee.

The *hip-joint* is occasionally involved by direct or adjacent injury, but more commonly its muscular control is weakened after treatment in abduction by plaster or traction for fractures of the femur. Stiffness responds to simple exercises and, in any case, apart from loss of extension, causes only minor disability. Muscular weakness, however, is a major factor in the persistence of the "calliper gait." Power is restored by regular resisted exercises, using sandbags or a simple weight-and-pulley mechanism, and also by suitably graded active P.T., games, and rambles.

The action of *normal walking* requires mobile toes, at least 10° dorsiflexion at the ankle, 70° flexion of the knee, and a small but adequately controlled range of movement at the hip. The basis of normal walking is correct placing of the foot. Any deviation in direction and position of the foot as compared with the normal limb throws the mechanism out of gear and results in a limp. The weight of the body is not transferred direct from heel to toes, but passes along the outer border of the foot and thence across to the ball of the great toe, producing a rolling action. This action can be taught as a dissected movement as early as the non-weight-bearing, sitting stage as advocated by Mennell (1940), but, provided the power of inversion of the foot and the control of the toes are restored, the normal rolling action is recovered naturally. If the foot is placed outside the line of march the trunk has to bend over it to maintain balance, hence the typical "calliper gait." Even if the foot is correctly placed the glutei may be too weak to maintain the hip in a position outside the line of the foot, though this failing is more commonly due to the muscles having lost the "feel" of the normal gait. Before normal walking can be expected the patient must learn to stand on the injured leg alone without deviation of the body, and he must then learn to keep this position as the good leg swings forward. Walking with a stiff knee is often a residual habit, and is usually countered by bringing the injured leg forward with a slight kicking action. These fundamentals of walking should be taught at the restricted weight-bearing stage, when the patient is taking part of his weight on his arms, using a chair, wall-bars, etc. At the full weight-bearing stage it should not be necessary to do more than redevelop the spring from the foot and ankle, and correct minor deviations with the aid of a full-length mirror and a painted line on the floor.

Re-education in *running* can be begun at the partial weight-bearing stage. With part of the body weight supported by the hands and the body inclined a little forward, the patient is taught to mark time with a running action, getting a slight bounce off the balls of his feet but keeping his toes on the floor. The movement must be symmetrical, the good leg gearing down to the strength of the injured one. The amplitude is gradually increased till the toes leave the floor without breaking the rhythm and without a deliberate attempt to lift them. At the full weight-bearing stage the exercise is repeated without support, the arms swinging close to the chest as in running, and progressing to standing running, backward running, normal running, and sprinting. An even rhythm must be maintained; if the rhythm is broken the exercise must be restarted at an earlier stage and worked up again.

The Trunk

An uncomplicated case of compression fracture of the *spine* is fit for advanced activity almost as soon as the patient has become accustomed to his plaster jacket. Exercises are directed to the maintenance and further development of the erector spinae group and abdominal muscles, to progress from single to two-leg raising, and in trunk-raising, first with the hands clasped behind the back and then successively with arms at the sides, hips firm, "neck rest," held above the head, and finally holding increasing weights above the head. These exercises are further performed lying with the thighs across a stool, the legs being held by an assistant; and they are supplemented by very strong backward bracing. It is of the utmost importance that the back muscles should be very strongly developed *while the back is still immobilized in plaster*. After removal of the jacket the patient requires about 48 hours of light informal mobilizing exercises (swimming is suitable) before returning to the routine of the "spine group." Apart from "unrolling," specific flexion exercises are best avoided for the next two weeks. After hyperextension plasters, posture always requires attention, and the exaggerated lordosis should be corrected by abdominal contractions combined with tensing of the buttocks. Progressively active games, including the use of heavy medicine balls, are good for mobilization and for the re-creation of confidence, and the routine should progress to include really heavy manual work for increasing time periods, the best of which is the use of axes, sledge-hammers, and cross-cut saws. Suitably treated, these cases carry an excellent prognosis (rather less favourable in the comminuted than in the "concertina" types of fracture); but, in spite of strong mobile spines, minor symptoms, particularly low back pain on prolonged sitting, sometimes persist for some months, though these rarely render a man unfit to carry out his duties.

Cases of *"sciatica" and low back pain* are troublesome to treat, particularly as many are of long standing and tend to develop a considerable functional overlay. They are rarely suitable subjects for the active routine of the rehabilitation centre, but they do benefit from extensor and abdominal exercises, so far as these can be performed. The increase in muscle power and activity helps to eliminate some of the psychological disability. Many such cases are treated in plaster jackets applied with head suspension, and this often gives complete relief from symptoms. They can then be treated in a class with the fractured spines in plaster and, the inhibitory factor of pain being eliminated, muscular development and general well-being can be more rapidly re-established.

Conclusion

Prescription, both in quality and in dosage, is as important in rehabilitation as medicine, and just as each dose is duly measured by the sister, so should the exercises be supervised. The personal interest of one individual in the person and progress of the patient means a great deal to him. This individual need be no more exalted

than the nurse or instructor detailed to supervise the exercises. The doctor's active interest in the patient's progress, backed by regular accurate measurements, is essential, and he should ensure that the exercises are being done according to his instructions. The organization of the hospital, and the rehabilitation centre, are ideal for the purpose, but this treatment is no less important in domiciliary practice. In the absence of adequate supervision such exercises can embody only the bare essentials.

The Rehabilitation Workshop Scheme organized in Birmingham (Colson, 1944) is a vital contribution to rehabilitation in industry. The methods employed are clearly not applicable to the household, but suitably chosen manual occupation has its place in domiciliary practice, and the little extra trouble involved is likely to pay good dividends.

Summary

Orthopaedic rehabilitation is largely a matter of *maintaining* the existing power and activity of muscles.

The roles of ward sister, P.T. instructor, physiotherapist, and occupational therapist are discussed.

Rehabilitation methods based on experience at a Royal Naval hospital and its annexed orthopaedic rehabilitation centre are described.

The importance of prescription and of personal interest in the individual patient is emphasized, and a plea is put forward for the inclusion of active rehabilitation in the treatment of injuries in domiciliary practice.

I wish to thank Surg. Lieut. A. McKelvie, R.N.V.R., for his assistance in the final draft, and to acknowledge with gratitude the encouragement and advice of Dr. H. E. Moore, Consultant in Rehabilitation to the Royal Navy, many of whose ideas are embodied in this paper. I also wish to thank Surg. Rear-Adml. R. F. P. Cory for permission to offer this paper for publication.

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INTERNATIONAL SOCIETY OF SURGERY

The activities of the International Society of Surgery have necessarily been largely in abeyance during the war, but now that hostilities in Europe have come to an end there are promising signs of resuscitation. During the meeting of the Association of Surgeons at the Royal College of Surgeons in May there was an informal gathering of those Brtitish members of the International Society who happened to be in London then. They were very glad to welcome Dr. Leopold Mayer, of Brussels, the president-elect of the International Society of Surgery, and other Belgian and American members who were guests at the meeting. The steps taken by the American committee to hold the Society together in that country during the war years were explained, and it was recognized that these were only a temporary war measure designed to keep the Society alive and its interests revived. A meeting of the International Committee is to be held as soon as this can be arranged, and there is some hope that the full meeting of the Society, which was originally planned to take place in Stockholm in 1941, may be held in that city in 1947. Meanwhile, the surviving officers who were elected at the Congress held in Brussels in 1938 will continue to act and conduct the affairs of the Society strictly according to the constitution. Prof. Grey Turner is the British delegate on the International Committee.

ROCKEFELLER FELLOWSHIPS IN PREVENTIVE MEDICINE

The Rockefeller Foundation is prepared to award a small number of Fellowships to enable medical men and women wishing to take up public health as a career to engage in special studies for this purpose. The Fellowships, which will be open to British-born subjects holding a university degree in medicine registrable in the United Kingdom, will normally be awarded for two years, and the annual value will be between £450 and £800, travelling expenses being paid during residence abroad. Candidates should have had some general clinical experience since registration, and service with the Forces will be taken into account.

The conditions of tenure provide that normally a Fellow will be required to study preventive medicine for not less than one year at the London School of Hygiene and Tropical Medicine, taking part in teaching and demonstration and devoting himself to some special investigation approved by the committee of award. He will be given an opportunity of taking the D.P.H. For part of his tenure he will be expected to study at suitable institutions abroad, and arrangements will be made by the Rockefeller Foundation for this purpose. He will be required to keep a daily record of his work for submission as requested by the committee of award, which will have power to terminate his Fellowship if obligations under it are neglected. No other award may be held, and no other work, paid or unpaid, may be undertaken at the same time as the Fellowship without permission. Candidates should write informally to the Dean, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, giving date and place of birth, full details of school and university education, including qualifications and present and past appointments, and full particulars about themselves, their work during the war, and plans for the future. The names of two referees should also be given. Medical officers with the Forces may apply now for Fellowships tenable on demobilization.

ARGENTINE–BRITISH MEDICAL CENTRE IN BUENOS AIRES

An Argentine–British Medical Centre has been established in Buenos Aires, with the assistance of the British Council, to promote closer relations and to facilitate the exchange of information between the British and Argentine medical professions. The Centre has a Committee of Honour, the twenty-two Argentinian members of which include Prof. José Arce, Prof. Pedro Escudero, Prof. B. A. Houssay, and Prof. Alfredo Sordelli; British representatives of various branches of medicine have been invited to join this committee. On the executive committee are the President of the Centre (Dr. Mariano R. Castex), the director (Dr. Antonio Egües), the secretary (Dr. R. Castro O'Connor), an assistant secretary, three ordinary members, and two representatives of the British Hospital in Buenos Aires.

The Centre's library contains a selection of the most important British medical journals and up-to-date textbooks. When an inquiry cannot be answered on the spot the Centre obtains information, articles, and books (or photostat copies) from Britain through the British Council. Among the activities are distribution of the *British Medical Bulletin* (Spanish edition), supply of medical films, translations from English into Spanish and Spanish into English, and certain facilities for members wishing to subscribe to British medical journals or buy British medical books. Members of the Centre pay an annual subscription, and additional charges are made for such special services as the provision of photostat copies. The facilities are available to doctors in the interior of Argentina, who, since they are not in a position to borrow original books and articles, are supplied with photostat copies. English classes, in which the emphasis is on conversation and the reading of medical books, are an important and very popular feature.

BRITISH ASSOCIATION OF UROLOGICAL SURGEONS

At the first annual general meeting of the British Association of Urological Surgeons, which was held at the Royal College of Surgeons, London, on June 29, it was announced that the following had accepted honorary membership: Sir C. A. K. Ball, Surg. Rear-Admiral G. Gordon-Taylor, Sir Hugh Lett, Mr. Cyril Nitch, Mr. A. Ralph Thompson, Prof. G. Grey Turner, Mr. Henry Wade, Sir Alfred Webb-Johnson, P.R.C.S., and Surg. Rear-Admiral R. J. Willan. Seventy Home Foundation Members had been elected, and names were accepted of five honorary members, forty-eight full members, and ten associate members from over-seas. The constitution of the association was confirmed and the rules were approved. Prof. Fey, professor of clinical urology in the University of Paris, was welcomed as a visitor, and was elected an honorary member. In the afternoon, by kind permission of Major-Gen. H. H. Blake, the members went to the Spinal Injury Centre, Stoke Mandeville Hospital. After a brief discussion on the work of the centre, the party visited the wards, the physiotherapy and occupational therapy departments, and the gymnasium, where there were demonstrations of selected cases.

Nova et Vetera

A PORTRAIT OF CHARCOT

Charcot, who was a friend of Alphonse Daudet, was one of Léon Daudet's sponsors when he entered the Paris school of medicine. Léon Daudet[1] describes Charcot as resembling a stout Napoleon, who tyrannized over those about him and spoke to them in imperious and often ironical tones. Daudet, as have many others, speaks of his genius as a clinical diagnostician. But his patients were to him little more than puppets, who were the convenient objects of an intellectual exercise. Daudet describes him as "pitiless" towards human beings but sentimental towards animals—a familiar combination—and as treating his many dogs as if they were children. His knowledge of the great poets, of the philosophers, and of European painting was extensive, and he brought to bear upon his own subject the same detached and analytic intellect, disdaining therapeutic intervention. His views on religion were those of an agnostic, for which, together with his inflexible faith in democracy and the benefits of the Revolution, he earns Daudet's censure. He is said to have declared that only one titled person had ever had any intelligence—a Dr. de Sinety, the author of "a remarkable work on the liver in nursing mothers."

One of Charcot's greatest weaknesses was his intolerance of contradiction or criticism, which he countered by ferocity or by sustained campaigns of petty persecution. He was a tireless worker, and would sometimes spend most of the night preparing a diagram or illustrative figure. Stupidity exasperated him, and yet his fear of competition caused him to gather round him professional mediocrities. In compensation, he found much pleasure in the society of the writers and artists who were constant visitors to his house. He was a devoted and tolerant father, and allowed his sons and daughters to make the house resound with their noisy games and laughter, often to the discomfiture of the nervous wrecks who waited to consult him in a drawing-room equipped with stained-glass windows and pseudo-mediaeval furniture. Daudet, perhaps with picturesque exaggeration, describes patients from the far corners of the earth writhing about on strangely shaped prayer stools, or sitting with their atrophied limbs stretched on chairs decorated with gargoyles—waiting to receive their prescription for nux vomica or bromide from the Master.

In his dealings with patients Charcot did not hesitate to give expression to a savage, and often deliberately obscene, sense of humour. He is said to have told a neurasthenic: "You are like a man sitting on a dung heap with a sword suspended over his head; you must either get under the manure or lose your life." Charcot read English, German, Spanish, and Italian, and his library contained, in addition to a large literature of mental disease, many works on magic and demonology. The presence of works in the latter category gives an additional key to Charcot's character. It is clear that in an age when science was invested with a romantic popular interest he was victim to the idea of himself as a maker of magic—as one able to predict the workings of the hidden forces of Nature and influence the behaviour and fate of other men. He had a paranoid disposition. At his famous clinic at the Salpêtrière Charcot was brusque to staff, students, distinguished visitors, and patients alike. His clinical demonstrations were stage-productions, spiced with literary and artistic allusions. Daudet says that Germans bored him, but that he showed a liking for English and Russian visitors. In 1890 he was at the height of fame and influence, and it was in this year, during a gay Christmas Eve party, that he was seized with an attack of acute precordial pain. Daudet, who was present, ran across the road to fetch Prof. Potain. It was two o'clock in the morning, and Potain answered the summons in his night-shirt. Slipping on trousers and a fur coat, he came to the aid of his distinguished colleague, spending fifteen minutes alone with him. On emerging from Charcot's room Potain pronounced the trouble to be of gastric origin, but as the young Daudet walked back with him, he said: "I had to reassure him, he thought it was angina pectoris"; adding after a pause, "He was not wrong." Deeply distressed, Daudet asked: "How long will it be, sir?" Potain replied: "Two years, two years and a half at the most." On the following day Charcot had recovered, but in 1893 Potain's prognosis was fulfilled. N. H. J.

[1] *Memoirs of Leon Daudet*, edited and translated by A. K. Griggs. London, 1926.

THOMAS BILL, M.D.: PHYSICIAN TO HENRY VIII AND EDWARD VI

The following details about this physician, in addition to those recorded by Munk in the *Roll of the Royal College of Physicians*, may be of interest.

Munk states that he was of Bedfordshire and that he took his M.D. from Pavia, but Venn, in *Alumni Cantabrigienses*, gives him as the son of John Bill, of Ashwell, Herts, and as M.D. of Padua. He also states that a pedigree of the family is in Cussaus's *History of Herts*. I have not seen this, but can state that there is no mention of Thomas Bill in either Sir Henry Chauncy's or in Clutterbuck's History of the County. Among other monastic plunder he obtained in 1542, as we learn from the State Papers of the period, the rights over certain fisheries in the Trent and in the pool called Depedraught, beside the Monastery of Burton-upon-Trent, formerly reserved to the Monastery. There was also a tenement within the close of St. Bartholomewe beside Smithfield, lately the property of Bart's, which he secured in June of the same year. In the next year he had a grant of St. Sepulchre's Rectory, London, late the property of Bart's.

In 1548 we get the letter, referred to by Munk, from Princess Elizabeth (afterwards Queen Elizabeth) to Somerset, thanking him for his care and for sending Dr. Bill to her in her sickness. Bill died in 1551, and is entered as Phisition to the King's Majesty on the Probate Books. The following is an abstract of his will:

(*P.C.C. Powell 7.*) Soul to God. Body in church or churchyard where I may die. To the poor at my buriall, £4. The Parson of Sacam, Co. Herts, 3/4. The Poor there, 6/8. Poor of great St. Barts, 6/8. Servants 10/- each. To my mother, 20/-. Brother John Bill, and his wife, brother Samuel, and his wife, Brother Gosnolde, and his wife, 6/8 each. Brother William Bill, D.D. my prebend called Mylton in Oxon, belonging to the church of Lincoln. To wife, Agnes, my house and garden in great St. Barts for life, then to my daughter, Margaret and her heirs. To wife, woods, etc., called Rowney Lands in Herts, then to daughter, Margaret: lease of grayne, corne in Cropthorne and Everbury, Co. Worcester, late of the Priory of Worcester held for 21 years of the Court of Augmentations, now let to Raffe Parsones for 19 years. Lease of the farm at Sacam to wife for life then to daughter, Margaret. Manors of Higham and Lelychurche in Kent leased me by St. John's College, Cambridge. To Margaret 1/3rd of plate and household stuff, etc. Wife Agnes, Brother John Bill, and Brother-in-law Richard Tebolde of Kemsynge, executors. 4 witnesses.

Bill's wife was Agnes, sister of Richard Tebolde, of Kemsing, Kent. Brother Gosnolde was his brother-in-law, Thomas Gosnold, of London, grocer. Munk hints that William Bill was his younger brother and that the college granted him the manor of Higham when William Bill was Master of St. John's. William certainly was the brother of the physician; he had a distinguished career in the Church, ending up as Dean of Westminster, where he is buried in the Abbey. R. R. J.

AN ACADEMY OF MEDICINE

Although medical societies flourished in Paris before the Revolution and, under Bonaparte, an Academy of Medicine was constituted it did not long survive; the existing Academy of Medicine was created by ordinance of Louis XVIII on Dec. 20, 1820, and in 1920 its centenary was celebrated. The proceedings are recorded in a handsome volume,[1] and, in view of recent correspondence in the medical and lay press, it may be interesting to refer to some points in the history of the Academy of Medicine.

The primary duty of the Academy, prescribed in the ordinance of 1820, was "to answer questions of the Government on all matters relating to Public Health, especially on epidemics, diseases peculiar to particular countries, epizootics, questions of legal medicine, the distribution of vaccine, the investigation of new remedies and secret remedies, internal and external, mineral waters, natural and artificial, etc." The Academy was also charged with the continuation of the researches of a former Royal Society of Medicine and of a former Royal Academy of Surgery in the whole field of the healing art. The administrative details prescribed in the original constitution were varied from time to time, but the number of ordinary members, fixed

[1] *Centenaire de l'Académie de Médecine, 1820-1920.* Paris: Masson, 1921, pp. 277.

at 100 by an *arrêté* of 1835, has not been changed. The membership of a society may be limited either directly, in this way, or indirectly, by admitting a fixed number of new members at regular intervals. The former method has not been much used in learned societies in this country ; the other method is adopted by the Royal Society of London ; it will not, of course, ensure an absolute constancy of the number of members, but, unless the death rate rises or falls continuously, the society will, after initial fluctuations, keep a fairly steady level of population.

The fixed population of the Paris Academy of Medicine is a very small fraction of the population of the medical and allied professions in France, and in the nature of things so small a body must tend to be an order of merit ; it will therefore consist of men of established reputations not usually young. The Academy of Medicine, however, is not simply an order of merit ; it is assigned definite responsibilities. In the centenary addresses of Vaillard (mainly concerned with public health, bacteriology, and epidemiology), of Chauffard (on general medicine), and of Delorme (on general surgery) we have a heartening account of French contributions to the science and art of medicine. How far the Academy, as such, initiated these is not easy to say. Indeed a reader may sometimes have doubts. In speaking of vaccinal syphilis Vaillard remarks : "Indeed the Academy was sometimes too slow in sanctioning new truths applicable to the protection of the public health." Elder statesmen do move rather slowly ; perhaps wisely. One might expect that an order of merit would rarely be very insistent advocates of drastic reforms.

Reports of Societies

MANAGEMENT OF THE PERMANENT COLOSTOMY

A meeting of the Section of Proctology of the Royal Society of Medicine was held on July 18 for a discussion on the management of the permanent colostomy. Mr. F. McG. LOUGHNANE, who presided, said that the establishment of a colostomy was looked upon by the average patient as a tragedy. Moreover, many surgeons performed colostomies but by no means all gave their patients adequate guidance as to their management ; hence the present discussion.

Mr. ERNEST MILES said that very few doctors appreciated the value of a daily wash-out of the colon for regulating bowel movement. Consequently when the patient was discharged from hospital he was left very much to his own devices, and it was small wonder that he got into trouble. Bowel action after colostomy could be controlled by a daily plain water wash-out at a temperature not exceeding 80° F. A higher temperature reduced the muscular tone of the colon, and caused part of the wash-out to be retained, with a sudden gush of fluid some hours later. He emphasized the necessity for absence of tension ; everything should be easy and comfortable. The patient's belt should only be dispensed with at night when he was recumbent. The stump of the colostomy should be prevented from becoming stenosed by systematic dilatation.

Sir CHARLES GORDON-WATSON said that the management of colostomy had been much neglected. In the old days of lumbar colostomy its bad reputation might be understood, but he had operated on patients in every walk of life, and many of them had carried on their work in reasonable comfort and with only slight inconvenience. There were differences of opinion as to where a colostomy should be made. He liked to make it through the rectus muscle. The spur should be kept outside the abdominal wall for at least three weeks. Another point was not to make the opening too big ; he always made it so that one could get one finger on either side of the glass rod. Sometimes the skin began to contract round the colostomy opening, and there was a tendency for the spur to be pushed back, so that faecal matter got into the cul-de-sac. Sufficient skin should be removed at the time of the primary incision to ensure that it did not get too close to the margin of the colostomy. If there was no obstruction he thought it wise not to open the colostomy before about the fifth day. Sometimes the opening through the rectus muscle stretched and the colostomy area herniated. This might be overcome by using a bigger disk on the colostomy belt ; he never used cups. With regard to the wash-out, he liked to have a big tube, which should be passed very carefully and slowly. It was necessary to find out how much fluid the colon would hold. The amount varied very greatly ; he had known as much as 5 pints go into the colon.

Danger of Perforation

Dr. W. B. GABRIEL drew attention to the seriousness of the risk of perforation of the colon in the wash-out region. After a colostomy had been satisfactorily established, whether terminal or loop, it must be decided whether the bowel was to be allowed to act naturally or a wash-out regime adopted. He had collected from St. Mark's Hospital the records of eight cases of perforation—six in males and two in females. One case occurred while the patient was still in hospital ; the others were admitted as emergencies at different times after discharge varying from two days to 2¼ years. The case occurring two days after discharge was in a man aged 64 in whom some force had been used at a wash-out, the patient immediately complaining of severe pain. The doctor subsequently diagnosed peritonitis and sent him to hospital, where he was moribund on admission and died an hour later. Post-mortem examination revealed general peritonitis and a small perforation on the mesenteric border of the colon. Perforation usually occurred 2 in. to 2½ in. above the colostomy, and if the peritoneal cavity was entered gross contamination would result. Various causes might be held responsible for the perforation, such as the use of a large heavy tube or a tube made of hard inelastic rubber, and the possibility of inexperienced handling or injudicious force applied in passing the tube should always be borne in mind. There might also be local predisposing causes. In some cases the colon had an unduly thin wall and possibly diverticuli were present ; the point of the tube or catheter might be lodged in the thin-walled sac and a very slight force would cause perforation. One point of interest was that all the patients concerned were over 60 years of age. The characteristic symptom was severe abdominal pain during or just after the wash-out and a rapidly developing peritonitis. Out of a total of nine such cases eight proved fatal.

Mr. E. T. C. MILLIGAN showed a number of lantern slides illustrating the linings in a colostomy, and spoke also of the time, patience, and team work needed in order to obtain the desired rhythm of one bowel action daily.

Technique of the Wash-out

Mr. LAWRENCE ABEL said that surgeons had been too hesitant in emphasizing to both patients and their doctors that the patient with a colostomy could obtain easy and perfect control. The secret of the control of the colostomy was the daily wash-out. The wash-out should start two or three days after the operation was performed, and the patient should be trained as to the quantity of plain water necessary to cause a proper colonic reflex. The question of breakfast needed a little consideration. When the patient woke up and drank a cup of tea he had a slight gastro-colonic impulse ; he should be instructed to get out of bed and have his breakfast—preferably a square meal—immediately. That would result in a good flush down to the colon. There were cases which did not need a daily wash-out and could get the bowels regular without such an expedient, but it could not be known in advance which patients these would be, and every patient should start by having his morning wash-out after breaking his fast. The wash-out should if possible take place in a combined bathroom and w.c., and the patient be comfortable in a lounge chair. A soft rubber tube must be used. In over a thousand cases he had never seen a perforation with a peacetime rubber tube, but he had seen three cases with wartime rubber. It did not matter how cold the water was ; cold water from the tap was best. The average patient should be in and out of the bathroom in half an hour. If the colostomy was an old-fashioned one it must be supported by a belt ; if it was a modern colostomy a belt was not needed. The patient should have a lint pad, but the soft side must be used and greased with a little vaseline or zinc oxide ointment. If there was a cul-de-sac left it would accommodate faecal matter and should be washed out once a week. The patient should also be instructed to see the surgeon at regular intervals.

Mr. A. DICKSON WRIGHT said that breakfast in bed was a very good way of making a colostomy work. Some speakers had minimized the discomfort of a colostomy, but he had never found a patient other than delighted to say farewell to it. He described one man who had had a colostomy performed 15 years previously and had developed a hernia which was larger than the whole of his abdomen. He excised the affected gut and joined the descending colon on to the rectum, and the patient made an uninterrupted recovery. The hernia was quite manageable and the patient's whole existence was transformed.

Mr. H. J. MCCURRICH said that the cases of perforation which had been mentioned occurred apparently when the wash-out was done by a nurse or relative. If the patient was well trained was perforation likely to occur if he did the wash-out himself? Dr. S. W. PATTERSON said that a number of patients did not need a wash-out and were able to get a steady and firm action of the bowel, though at certain times of the year, when fresh fruit and vegetables came in, they had to be particularly careful. In diverticulitis, where much more of the bowel was involved, it was sometimes necessary to make a transverse colostomy. Patients must not be allowed to think themselves social pariahs.

In some further discussion Dr. G. VILVANDRÉ spoke in disapproval of transverse colostomy, and also emphasized the need for teaching young surgeons and radiologists the dangers which might attend passing the cathether into the gut. Mr. MICHAEL SMYTH mentioned the ease with which a colostomy might be closed.

MEETING ON SEMINOLOGY

A meeting of workers interested in seminology and other aspects of infertility was arranged by the Family Planning Association and held on July 14 and 15, by courtesy of the University authorities and of Dr. J. Hammond and Dr. A. Walton, at the School of Agriculture in Cambridge. The animal research workers opened the conference with some interesting papers and demonstrations on the metabolism of semen, on fertilization, and on early death of the fertilized ovum, and on the respiration of spermatozoa. Aspects of human seminology and the investigation of infertility were discussed by various medical workers.

Dr. MARGARET HADLEY JACKSON gave a brief report of some of the work done at the Exeter F.P.A. clinic on semen analysis, and suggested a method which might be of value to clinicians in grading male fertility. She also discussed the post-coital test (including examination of the vaginal pool and cervical mucus), and stressed both its value in the investigation of cases of infertility and the ease with which it could be carried out. Between 600 and 700 such tests had been done at the clinic on most days in the cycle, and at times after coitus varying from half an hour to 12 days in both fertile and infertile wives. It was usually possible to find sperm, provided the test was repeated often enough within 12 to 15 hours after coitus, even when the husband had a sperm density as low as 2 or 3 millions per c.cm. Those cases in which the early post-coital test remained persistently and completely negative were rare, even in infertile couples, and Dr. Jackson produced evidence suggesting that tests done at longer intervals (40 hours or more after coitus) might provide a more valuable measure of adequate fertility.

Mrs. CLARE HARVEY, of Exeter University, in a paper on the interpretation of morphological abnormalities in human spermatozoa, suggested that most, if not all, abnormal types might be produced by degenerative changes in sperms which had been morphologically normal when first detached from the germinal epithelium. Evidence suggested that most morphologically abnormal spermatozoa were, in fact, aged spermatozoa. Most specimens produced a week or more after the previous ejaculation showed a higher abnormal count than those produced at shorter intervals. The average age of sperm population at ejaculation might be increased by delay in the journey from the testis through the epididymis and vas. There appeared to be a close relationship between the motility of the spermatozoa and their age. Figures from 130 recent semen analyses showed that in at least 75% of cases a high motility and good morphology of sperms were combined, and also low motility and poor morphology.

It is hoped that in 1946 the meeting may be held in London.

Correspondence

Education in Safe Milk

SIR,—The vigorous speeches at the recent Representative Meeting and your own impressive leader (Aug. 4, p. 160) may well be welcomed by senior members of the profession who for a number of years have endeavoured to secure for the community a milk supply safe from the risks of tuberculosis and other infections. In this respect the British Medical Association, together with other organizations, has met the responsibility which falls on the profession as guardian of the public health. Nevertheless, it has to be admitted that successive Governments have not been impressed, not at least to the point of action, and that the public generally is largely uninformed and unalarmed. May it not be well to supplement corporate votes and resolutions by the teaching influences of the individual doctor? Given, say, 20,000 doctors each using his opportunities to impress upon his patients, and especially on the parents and guardians of children, the dangers of raw milk and the protective values of pasteurization, there might reasonably be expected a demand for safe milk which the commercial interests concerned would find it profitable to supply. Such an educational policy would be an exercise in the practice of preventive medicine and a further contribution to the discharge of an admitted responsibility. There are interests actively opposed to the pasteurization of milk, and to meet these the Government needs not only the opinions of experts but also the support of public opinion. And in the development of that support the individual doctor has his opportunity.—I am, etc.,

Hove. C. O. HAWTHORNE.

Milk Still Unsafe

SIR,—"We are left to speculate what the drag on the wheel may be—departmental lethargy or the opposition of agricultural interests." To this quotation from your leading article (Aug. 4, p. 160) might have been added the lack of pressure and determination of the medical profession to see this job through when it had started on it. It is "the little more" that is needed, and I venture to hope that Mr. Lawrence Abel's renewal of the attack and the prominence given to it in your able leader are an earnest that the scandal of our impure milk supply will be ended by the adequate pasteurization of all milk intended for human consumption. Personally I doubt the wisdom of exempting T.T. milk or "accredited" milk from a single herd. Typhoid and many other infective elements don't spare either, and the conditions of "watering" animals on some of our farms leave much to be desired.

The opposition of wontedly harassed and hard-pressed "agricultural interests" may or may not be understandable, but it is undoubtedly real. Some of these "interests" sit on the milk committees of our county councils and county borough councils, and, whilst zealots for "pure milk," are not backward in indicating opposition to what they regard as "further burdens on the industry." I remember once addressing the members of one of these committees, of which I myself was a member, about the importance of an abundant and pure water supply for cattle on our farms, and the necessity for fencing off all muddy and contaminated sources from ditches and swamps to which cattle often has ready access. I was giving them a lurid example close by in their own area, where a little streamlet draining down from the hills through village and hamlet was dammed up here and there adjoining fields where cattle was grazing. It was no unknown sight to see the housewife emptying an occasional pail into this stream as it passed her door, and into the dammed-up pools the cows would stray to water, and "stale," and stamp the whole filthy area into a grim and revolting quagmire. I was suggesting that these "cesspools" (for they were nothing else) should be fenced off from cattle access and the "possibilities" arising therefrom through drinking and the soiling of pendulous and rarely washed udders. I expect, however, I was manifesting my innocence and ignorance of the practical problems affecting the safe milk campaign, for just as I was winding up my remarks a smile broke over the faces of members at some interjected witticism which I had evidently evoked

but was unable to catch. I resumed my seat in an atmosphere of hilarity and mirth. So far as I am aware, however, *nothing has been done.*

My own limited experience leads me to believe that it would be unwise to make any exception to a general pasteurization order except in the case of supplies intended for "processing" at high temperatures. If I may be permitted I should like to reiterate and emphasize your own remarks on America's attitude to this important question: "American troops in this country have not been allowed to drink milk unless it was *both from tuberculin-tested herds and had been pasteurized*; yet, so far from insisting on the double protection, we do not even make universal the simpler of the two expedients." I commend America's realism and thoroughness and your comment. The medical profession must maintain a crescendo of pressure and determination to get pasteurization established. But the order must be a general one and emanate from central authority.—I am, etc.,

Bournemouth. J. ROSS MACMAHON.

SIR,—Having just spent a fortnight on a farm which runs a herd of tuberculin-tested Jerseys I am acutely conscious of the delight of pure milk as compared with pasteurized milk. You say in your leading article (Aug. 4, p. 160) that it would cost £10 million a year to pasteurize all milk and deprive us for ever of the joy of tasting pure milk. £10 million annually is the equivalent of £400 million at 2½%. Would it not be more economical to pay £400 million once so as to enjoy pure milk in perpetuity, than to spend £10 million annually so as to suffer from pasteurized milk in perpetuity?—I am, etc.,

Petersfield. RICHARD HOPE.

Weight Reduction by Dieting

SIR,—The letter on weight reduction by dieting by "Apollonian" (July 28, p. 136) interested me very much. Hitherto we have, as a profession, taken little note of the effect of diet on the general well-being of our patients. One only requires to study the diets given in hospitals all over the country to find proof of that. In the past we have been too ready to rely on some specific medicine which would affect the organ or particular part of the body showing signs of disease, rather than consider the body as a whole. "Apollonian" opens up a new field for study and research. It would be interesting to know what changes take place in the human body during a prolonged fast. Does it alter the *p*H of the blood and the urine, and what changes take place in the intestinal flora? I have heard it stated that at the end of the long winter period the hibernating bear has sterile intestinal content, and that its flesh is sweeter to taste. Does this mean that a cleansing process has been going on during the fasting period?

I have watched many patients undergoing fasts for short periods of a few days to longer periods of 30 and 40 days. In no instance were there any adverse signs or symptoms during the fasting period other than a slight feeling of lassitude or a headache and loss of weight. Usually as the fast continued the feeling of well-being increased. Like "Apollonian" I have often experimented on myself, but regret that I had not the time and facilities to check up all the changes taking place in my body during the fasting period. Just recently I completed an 8-days fast while continuing my usual activities, which are not less than most doctors'. Here are a few changes that took place.

	Before Fast	After 8-days Fast
Weight (naked)	10st. 7 lb.	9 st. 11 lb.
Chest	36 in.	35 in.
Waist	33 in.	31 in.
At umbilicus	37 in.	33½ in.
Thigh	22 in.	20 in.
Calf	14 in.	13½ in.
Biceps	11 in.	10 in.

I may say it had a wonderfully rejuvenating effect on me and cleared up a few odd pains that I had. "Apollonian" says he took certain vitamins in tablet form, also an alkaline mixture three times daily and some sweetened non-alcoholic drinks. I took no vitamins or alkaline mixtures during my fast and only an occasional sip of water. My bowel moved at the beginning, but once or twice during the fast I had a colonic lavage. This may not have been necessary. It is well known that our seamen who have had to take to the boats after a shipwreck have no bowel movement even when 2 or 3 weeks on the open sea.

Scientific dieting may not be the most pleasant medicine, but in a few stubborn cases it is very effective. The patient may be put on an absolute fast for days or given fruit or vegetable juices, or drinks mixed with fruit juice and milk. If carefully watched there is never any danger.—I am, etc.,

Bishopbriggs, Glasgow. JOHN WINNING.

SIR,—I read "Apollonian's" letter on weight reduction by dieting with great interest, as I have myself fasted, but not with the same happy result.

After six days of fasting and working I was delighted to find that I had lost 16 lb., as I was over-weight. On the seventh day I developed acute gout in my left ankle. I found out too late that if one fasts, while it is not necessary to go to bed, it is essential that one should not work and should have a definite routine of mild exercise and plenty of rest. It is also essential that if one fasts one should also eliminate, as when the liver finds that it is not necessary to do its normal work it proceeds to rid itself of accumulated waste products. In "Apollonian's" case he relied on taking copious fluids, thus putting the chief work of elimination on the renal system. He should have had an enema on alternate days and a Plombières treatment at least once a week, sweat baths on alternate days, and massage on alternate days to assist elimination. In my own case I think that any waste products went to my left ankle, which was an old football injury, but which had given me no trouble for many years. I think it is much wiser for patients who wish to reduce their weight by fasting to go into a clinic which specializes in these things or at any rate to a spa where they can have eliminative treatment. I am all in favour of scientific fasting, not only for reduction of weight but for other diseases in which a septic focus cannot be found, but it must be scientific.

I was so ashamed of my obstinacy in thinking that I could fast and work, contrary to the advice of my friends, so I continued to work instead of going into a nursing home to rehabilitate myself. As a result I have had chronic rheumatism ever since. I have never put on weight again, and it would seem that my diet, which previously over-nourished me, now turns to uric acid, and it would also seem that once one's chemistry has been upset it is impossible to put it right again.

It would be interesting if "Apollonian" would write again and tell us how he is a month after his fast, and what type of diet he took to begin with before he returned to a normal diet, and when his bowels commenced to function again. I think he should have signed himself "Hercules" and not "Apollonian."—I am, etc.,

"CASSIUS."

Aspiration Test in Diagnosis of Breast Tumours

SIR,—I would be grateful for a little space in your *Journal* to emphasize the value of the aspiration test in the diagnosis of breast tumours. It is now generally agreed that every breast tumour must be regarded as a carcinoma until it is proved innocent, and it is because of this accepted view that an ever-increasing number of cases are being seen for early diagnosis.

A tense cyst situated in an area of chronic mastitis so closely simulates a carcinoma that one is often tempted to advise radical mastectomy without a preliminary incision of the tumour. Few surgeons would not confess to having performed a carefully planned radical mammectomy for an apparently obvious carcinoma, which upon subsequent incision and section proved to be an innocent cyst. A tense cyst is easily palpable with the flat of the hand, and as it finds its origin in an area of mastitis it imparts an impression of undue fixation in the surrounding breast tissue. When other confirmatory signs are lacking, one is justified in attempting to aspirate the swelling with a fine-bore needle. This simple procedure in a few seconds can banish any element of doubt concerning a lump in the breast. A few c.cm. of turbid fluid are withdrawn, the tumour vanishes, and only a depression remains in an area of mastitis, which can no longer be appreciated with the flat of the hand. Should the tumour be solid, the needle is felt to pass through it with increased resistance, whereas it pierces a cyst wall with characteristic ease and suddenness. The patient is therefore saved the

inconvenience of a biopsy, and can be kept under regular observation.

It can be argued that the trauma of needling may cause a carcinoma to "metastasize" more readily. This cannot be denied, but the degree of tissue disturbance must be minimal, and therefore probably is no more harmful than a series of determined palpations which a mammary tumour of doubtful identity usually suffers.—I am, etc.,

Chelmsford. M. D. SHEPPARD.

March Fracture

SIR,—Mr. Ian D. Kitchin (July 14, p. 64) has commented on the frequency of march fractures and their treatment. I am in entire agreement with him that these fractures should be relieved from weight-bearing in their acute phase. It is, however, worth mentioning that the acuteness varies considerably and the length of treatment can be modified accordingly. Radiological confirmation also depends on the severity of the lesion. The most severe cases do not show any signs of periosteal involvement under 5 to 7 days, and in the less acute cases this may be prolonged to 10 or even 14 days. Extremely mild cases are sometimes seen which have never been reported to the M.O. Such a case would give a history of slight pain in the foot a few weeks previously which gradually disappeared. Although this is not common, it shows that resolution may occur without any interruption of training. This is of interest, because the length and type of treatment can depend on the severity of each individual case. Over 200 cases have been observed, and at one time every case was put into a walking plaster for a month. This was discontinued when it was found that treatment was being unnecessarily prolonged. After a month in plaster, at least two additional weeks are required to mobilize and strengthen the foot muscles before full training can be recommended. Plasters may be required for the most acute cases, but the treatment of a case of average severity can be shortened by the use of a felt metatarsal pad. It is necessary to insist that Army boots are worn, because the thick and unbending sole forms a most effective splint. After one week most men are able to walk about in boots with comfort. Non-weight-bearing exercises are then commenced and training is very gradually introduced. Jumping and running should be forbidden for a month, and at the end of this time full training can be resumed. This method has advantages so long as it is used with discretion, and it certainly shortens the period of inactivity. It is, however, useless to keep a man on infantry training while he still has a painful foot, and march fractures should always be given a period of rest to allow the acute phase to subside.

Although the second or third metatarsals are the most commonly affected, fractures do occur less frequently in the fourth and fifth. It is possible for two metatarsals to be involved at the same time, and rarely three metatarsals may show march fractures. The aetiology is still obscure. Blair Hartly believes that they are analogous to the stress fractures of metals. It is possible that some interference with calcium metabolism predisposes to this condition.

In an article now in the medical press I have shown that these fractures are very frequently found in men who have adolescent kyphosis or signs of old rickets.—I am, etc.,

Lisburn, Co. Antrim. R. W. WINDLE, Major, R.A.M.C.

Emergency Treatment of Fractured Femur with Shortening

SIR,—I have just received the *Journal* of July 7 and am amazed at Fl. Lieut. J. Noel-Jackson's article on a case of fractured femur (p. 16). Evidently pride in the ingenious products of his blacksmith has blinded him to the gross faults in surgical technique which he displays. Even without the assistance of x rays he should have been able to tell from local tenderness, bruising, etc., that the fracture was in the neighbourhood of the great trochanter, and therefore the correct first-aid treatment was abduction in a plaster spica. If, however, he believed the fracture to be in the mid-shaft his first effort with a Thomas splint and skin traction was correct. This proved uncomfortable, probably through errors in applying the strapping, so he manufactures that abomination an ice-tong calliper. Under the conditions of lack of asepsis that no doubt prevailed, this implement is as dangerous as a Steinmann pin would have been and much less efficient. Then Fl. Lieut. Noel-Jackson finds that he is unable to use his callipers with a Thomas splint, so his patient blacksmith has to make a Braun frame, and with it all hope of immobilizing a pertrochanteric fracture disappears.

It was then decided to apply a plaster, so a board with a perineal post is slipped under the unfortunate patient, and the whole paraphernalia hoisted up on the delightful machine which is illustrated. I note that when the Braun frame was removed the knee became extended, thus displacing the fracture. Then plaster was applied. If your correspondent means a plaster spica I cannot see how he passed the bandage between the patient's back and the board; while if it extended only to the groin he might just as well have put plaster on the penis for all the effect it had on the fracture. I am not surprised that union was poor a few weeks later. I am surprised there was any union at all.

Fl. Lieut. Noel-Jackson is now entitled to ask me, "Well, what would you have done?" Here is my suggestion: a roller towel or domette bandage round the perineum and fastened to a hook behind the patient's head; a pudding bowl under his sacrum; pentothal anaesthesia if available, and failing this a full dose of morphine. The surgeon applies manual traction to the fractured limb for 5 minutes, abducting and internally rotating it, while an assistant pulls on the sound leg. When shortening is corrected a second assistant takes over the limb and maintains the position while the surgeon applies a plaster spica extending from the lower ribs of the opposite side to at least below the knee of the fractured leg and preferably to the sole of the foot. In this state a patient can lie comfortably till the snow has been cleared and he can be transported to hospital. Such a plaster if left on for months might cause hypostatic pneumonia, but for a few days it is quite safe. The final treatment in hospital would probably be nailing or Roger Anderson's "well-leg" traction. I have recently used the above method with perfect success, although I had access to pins, wires, Braun splints, and all the other ironmongery of the trade.—I am, etc.,

Messina. J. S. JOLY, Surg. Lieut., R.N.V.R.

Hereditary Transmission of Dupuytren's Contracture

SIR,—In the copy of the *Journal* of May 26, just arrived, there is on page 741 an annotation on clinical effects of vibrating tools, wherein your annotator tells us that "Dupuytren's contracture and ulnar paresis can undoubtedly result from the pressure of these tools on the palm of the hand." A few months ago the writer of an answer in your "Any Questions?" column (March 10, p. 354), with just as little hesitation, assumed that Dupuytren's contracture was due to trauma.

Now that is what Dupuytren imagined when he wrote about the condition in 1831. It is said that he observed it in his coachman, and he thought it developed through wielding the whip. With this authority to start it, the explanation was copied into the textbooks one after another, and this has gone on for the past 114 years or thereabouts. Mouldy and outdated, it is still there. Some angry person has said that it takes 30 years to get anything into the textbooks and 100 years to get it out, but, of course, people exaggerate. When this particular bit of misleading authoritarianism will fade out of our textbooks it would be rash to anticipate, but the contributors to our periodical literature could be usefully employed in getting on a little faster than the textbooks.

Since 1900, when Mendel's work became known, those who have studied such matters have seen reason to be extremely sceptical or, rather, to deny categorically that acquired characters are passed on by inheritance. Also, since Dupuytren's time there have appeared many papers about the condition bearing his name, some of them in the *British Medical Journal*, and many of them have recorded examples of its hereditary transmission. I confess that I have written about it myself. Your readers may not have easy access to a file of the *Medical Journal of Australia*. There, in the issue of Aug. 19, 1944 (pp. 177–82) they could find a large array of familial cases, included in 8 families. I quoted one family record, contributed by E. S. Stokes, which presented one line in which the condition was passed on through an unaffected daughter from grandfather to grandson. In a

second line from the same family stock it was passed on from a great-grandfather through an unaffected daughter, and then through her unaffected son, to a great-grandson. In the issue of the same *Journal* of Oct. 21, 1944 (p. 442), Marie Brown added a case in which it passed from a grandfather through his unaffected daughter to a grandson.

And now may I be allowed to quote from the summary of my paper.

"The still current view that Dupuytren's contracture is due to trauma or toxaemia is criticized. Such theories are found to depend on conjecture, a tacitly assumed major premiss, without attempt at proof. This assumption is that the condition present is an ordinary chronic fibrositis, and that, as such, it can be caused by agencies such as trauma or toxaemia. It is pointed out that if Dupuytren's contracture can be caused in this way, it provides an instance of the origination of a condition which is passed on to descendants, preserving its pattern. This presents a dilemma which is intolerable, and the theory is decisively rejected. The more likely alternative is that all cases of Dupuytren's contracture are familial, and would always be found so if the descent and complete family history were accurately known. It is suggested that the great preponderance of males, which extends to all cases, familial or supposedly non-familial, is capable of a Mendelian explanation."

—I am, etc.,

Sydney, N.S.W. C. E. CORLETTE.

Effects of Tobacco Smoking on Health

SIR,—I read Dr. Lennox Johnston's letter (July 21, p. 98) on the effects of tobacco smoking on health with the greatest interest, and with relief. At last tobaccoism, this tacitly accepted disease, with its many symptoms and serious effect on mortality, has been challenged. Dr. Johnston exposes the "tobacco taboo," which has such a stranglehold on the situation. Why have we tolerated this? Is there a real lack of moral courage in the medical profession to-day? Is it a question of "Physician, heal thyself"?

As a psychiatrist most of my patients are depressed, many suffering from various forms of anxiety neurosis. In far too many cases I have been told: "My doctor told me to smoke; he said it would soothe my nerves." The reverse has generally resulted; and the patient has become still more depressed and "nervy."

Of course the heavy smoker's cough is a universal symptom that we all meet with. I know one heavy smoker who, whenever he gets even a trifling cold in the head, develops a violent cough which lasts at least a couple of months. On the last occasion his wife said she was kept awake every night, once until 3 a.m., by her husband's "terrible cough." This must happen in thousands of homes, with consequent loss of sleep and efficiency. A lady who has had pneumonia several times is a chain smoker. She has frequent paroxysms of coughing that are distressing to witness. I was told that even in her sleep she wakes her family through this. Yet she maintains that her doctor has never even asked her to smoke less, or suggested that she should give it up.

You have only to request young men or women not to smoke in a non-smoking railway compartment (most older people will courteously comply) to receive the most vitriolic insults. Last week I was told by two soldiers that they only wished they had me in Germany with a tommy-gun, merely because I asked them not to smoke in a non-smoking compartment on a journey of just over an hour. The idea that cigarettes are an absolute necessity for all the Forces all the time shows how ingrained tobaccoism has become in the nation.

What is the cause of all this? In my opinion two separate fears and "big business." (1) Fear—i.e., lack of moral courage—of not being thought "modern." Considering that the modern world has exceeded all previous records in cruelty, beastliness, and destruction the actual achievements of modern life are, to say the least, doubtful. (2) Fear of having to face and deal with life without the dulling (so-called soothing) effect of smoking. (3) Immense financial interests are involved, and the sale of tobacco is pushed with all the skill and subtlety of psychology applied to business. I consider this mass suggestion in advertising one of the great evils of our time; its constant pressure in direct and indirect ways has a huge cumulative effect; and we must remember that with the end of the war in Europe it will increase. The result of this in the sale of patent medicines is bad enough (especially to my patients), but the harm done by advertisements of alcohol and tobacco is far more widespread and serious.

Smoking has immensely increased during the war—by 34% between 1937 and 1944, as Dr. Johnston points out—especially among women. We can only discover later the full effect of this, especially on the newborn child, on small children as well as older ones, and on the home. But I believe that smoking, this "means of administering a drug of addiction," is one of the causes of the increase in nervous illness. Our nation is numerically small, yet our position in the world is vital and we have an amazingly important mission to fulfil in the future. It is our duty to protect and promote the health of this nation in every way. The medical profession has done a very great deal to improve it, even during the difficult years of war. Is it not now time to consider honestly this insidious and increasing disease of tobacco smoking, and take courageous and energetic steps to overcome it?—I am, etc.,

London, S.W.1. SYBIL TREMELLEN.

Identification of Gas Cylinders

SIR,—Dr. A. Owen-Flood (April 14, p. 535) states that on the Coxeter-Mushin apparatus fitted with "Romac clips" it is not possible to connect the nitrous oxide or carbon dioxide cylinders to the oxygen flowmeter. There also appears to be a popular idea that the couplings used on this apparatus and on the new Boyle's table are non-interchangeable and foolproof. It is necessary to offer a warning against this supposition. In actual fact it may be possible to apply any of these clips to a smaller-sized outlet than the one for which they are designed, a perfectly satisfactory and gas-tight attachment being obtained by depressing the fastening lever in the reverse direction to the usual. This is a method of obtaining a tighter fit from the clip which we have been using on our high-pressure pipe-line for the past two years whenever the clips became worn.

On a new Coxeter-Mushin table which was placed in my charge recently direct from the manufacturers not all the clips are loose enough to stand misplacement; but it is possible to couple the nitrous oxide tubing to the oxygen cylinder, the oxygen tubing to the carbon dioxide cylinder, the nitrous oxide tubing to the oxygen or the carbon dioxide flowmeters, and the oxygen tubing to the carbon dioxide flowmeter. It is not possible to connect the clips to fittings larger than those for which they are intended; this leaves a safeguard in that a misplaced clip leaves its proper fitting uncovered and the attendant may notice this—except on machines equipped for a pipe-line where one of the two additional clips might be utilized or when the machine is not carrying its full complement of cylinders. A simpler, cheaper, safer, and more satisfactory method is to wire the rubber tubing, which lasts quite a long time, to the reducing valves, flowmeters, and any other connexions contained in the system.

I have worked both with the system where the anaesthetist does all the servicing of the machine and where he merely uses an apparatus already prepared, taking the responsibility for any mistake. I am convinced that the more or less skilled attendant employed in the latter case is not in the least likely to be deterred either by the improbability or by the difficulty of the mistake he is able to make. There appear to be only two solutions to the problem of avoiding such accidents as the fatal administration of nitrous oxide in the place of oxygen, as reported in the daily press recently. The first, the servicing and use of machines only by skilled anaesthetists, is reliable in theory. The second, the use of nothing but truly non-interchangeable connexions, either of the screw or of the male and female type, involves considerable problems, since it entails the modification of every machine and cylinder in the country.

In the meanwhile it seems a pity that the modern anaesthetic machines show so little advance in design. The introduction of permanent piping, for instance, would allow of the use of only one reducing valve of each type, and result in the reduction of the number of connexions by two-thirds. Let us hope that the improvement in the war situation and the activities of the committee now sitting on the subject will soon give us machines which will prevent this needless loss of life.—I am, etc.,

Worcester. E. F. GLEADOW.

Death Certificates

SIR,—What a profusion of literature we now receive all with the theme: "Now that the war in Europe is ended and we are no longer threatened by deaths from bombs and rockets, death from disease (heart disease kills 126,000 annually) is still with us"! Deaths from various forms of heart disease—126,000 are killed every year: how inaccurate this statement is! Practitioners know full well that with probably half the certificates they sign, giving heart disease as the cause, the actual reason for the exit was "old age," "worn out," or "B.T.S." (born too soon). But what happens if one is unwise enough to put "old age," "worn out," or "B.T.S." on the certificate? It is, of course, returned to us pointing out that these are "undesirable terms." The result is that one has to rack one's brains to think of some other cause. One probably argues with oneself that if a person has died of old age there was probably some form of "myocarditis"—hence "heart disease kills 126,000 in England and Wales in a year."—I am, etc.,

M. F. MCDONNELL,
Medical Officer of Health.

Northfleet, Kent.

Hypoglycaemic Fatigue

SIR,—I have read with great interest the annotation on hypoglycaemic fatigue (June 23, p. 881). It stresses the importance of a "physiological basis of many neurotic symptoms"—functional neurotic symptoms which are often vague, not connected with any one organ. I am thinking of patients with fatigue, tremor, effort syndrome, hunger pain, giddiness and faintness, or signs of an anxiety state without a personal cause. They have in common the sweat of the palms and the axillae, tachycardia, and on clinical examination no abnormality can be detected, but on laboratory examination the following abnormalities are found: (1) phosphaturia, (2) relative or absolute hypoglycaemia, (3) changes in the electro-encephalogram.

The phosphaturia was known to exist in so-called nervous or functional patients, some of whom were found to have hypoglycaemia, and when they had the hypoglycaemia they had phosphaturia. It seems to me as if there is a direct connexion or metabolic disorder similar to the acetonuria in diabetes mellitus. The hypoglycaemia appears to be time-bound, occurring, when it occurs, almost invariably at the same time of the day or night. Whatever its cause it is a psychosomatic syndrome, which must be approached by somatic treatment. Normal fasting blood sugars do not exclude hypoglycaemia after meals; but hypoglycaemia detected once only by a reliable and efficient observer demands investigations. That the so-called neurotic element is due to an organic foundation can easily be understood from the changes seen in the E.E.G.; further from the pathological findings as published by Lawrence, Meyer, and Nevin (*Quart. J. Med.*, 1942, **11**, 181). However, these vascular changes are not specifically cerebral. They can occur anywhere in the body, producing a thrombosis or necrosis—e.g., a case of coronary thrombosis in a hypoglycaemic attack was observed by me about ten years ago in a patient aged 38.

Hypoglycaemia or glycopenia or glycogenaemia is a typical instance of an apparently functional disturbance, but really caused by an organic abnormality, and if not recognized as such may lead to serious disability where there is no need for one. Untreated the functional disturbance may lead to: (1) that a person is labelled "functional," suffering from effort syndrome, functional dyspepsia, etc., and therefore disabled and unfit for certain occupations; and (2) that he may receive psychiatric or psychological treatment where organic treatment is simple and a primary necessity—a point which is easily forgotten. Lastly, I would like to point out that in some of these cases as in many chronic diseases disability only occurs at times of stress, and is not due to or connected with these chronic diseases, which independently need medical or surgical attention.

The following are among cases of hypoglycaemia seen by me which I believe are worth mentioning; the blood sugars are given fasting, and 30, 60, 90, 120, 180, 240, and 300 minutes after 30 g. of glucose.

(1) Carcinoma of oesophagus, no secondaries, in a male: blood sugar 50 mg. per 100 c.cm. blood; then after the intervals stated above 130, 126, 52, 41, 78, 63, and 67 mg. per 100 c.cm.

(2) Malignant pyloric obstruction, no secondaries, in a female, aged 58: blood sugar 72 mg. per 100 c.cm. blood; then 62, 62, 51, 71, 67, 44, and 40 mg. per 100 c.cm.

(3) Pituitary cachexia (Simmonds's disease; see *Lancet*, 1935, **1**, 1502): blood sugar 62 mg. per 100 c.cm. blood; then 130, 80, 70, 100, 78, 60, 60 mg. per c.cm.

In a fourth case—that of a man aged 31 with inner-ear deafness and macular retinitis—the blood sugar was 83 mg. per 100 c.cm. blood, and after 30 mins. 140 mg. per 100 c.cm., after 60 mins. 120, after 90 mins. 85, after 120 mins. 90, and after 180 mins. 65. This case is of special interest as all his symptoms and signs practically cleared up on thyroid treatment—a happy result, if a somewhat unusual and unexpected one.

The treatment in most of the cases consisted in frequent feeds and plenty of carbohydrates, and atropine grain 1/100 t.d.s. by mouth seemed to be of great value to the patient, who thus found relief from his unpleasant symptoms. Barbiturates like luminal apparently aggravate the symptoms and increase the frequency of the attacks.—I am, etc.,

L. RAU.

Highgate, N.6.

"Under the Influence"

SIR,—Twenty years ago, when I began the duties of a police surgeon, defendants in such cases were willing to be tried in a Magistrates' Court, but nowadays they have become wise as to the possibility of being acquitted if the case is tried by a jury, either at the Assizes or Quarter Sessions, and in nearly every case they now elect to be tried in such a manner. In consequence the lot of police surgeons in such cases has become intolerable. The hanging about at these courts, only to have the case dismissed by a jury after cross-examinations and evidence of some witnesses who do not appear to realize what evidence on oath means, is exasperating, to say the least of it.

It has recently been my experience to certify as "under the influence of alcoholic liquor" two motor-car drivers who elected to be tried by a jury and who were in my opinion both undoubtedly intoxicated at the time of examination. In both cases the accused were defended by very well known King's Counsel, who cross-examined me very closely. In each case I was in the witness-box for nearly one hour after waiting all day to be called, in spite of my asking to have my evidence taken first. In one case defending counsel objected to my being called first, saying that he wished to call witnesses in the correct sequence of events leading up to the arrest. I was called last out of a considerable number of witnesses, in consequence of which that day's medical visits had to be carried out hurriedly and somewhat indifferently later that evening, some cases not being seen till the next day or even later. The accused obtained an acquittal in spite of the medical and general evidence of all witnesses, and in one case in spite of the fact that the judge summed up against the accused.

The crux of the matter appears to be the clause in the report of the Committee, appointed in October, 1925, by the B.M.A., on Tests for Drunkenness. This clause states: "There is no single symptom due to the consumption of alcoholic liquor which may not also be a sign of some other pathological condition." In each of the above-mentioned cases defending counsel quoted this clause word for word and put the question to me as to its validity, to which I had to admit agreement. In fact, in one case after being questioned I was politely informed, "Well, Doctor, we have reached test fifteen and he is still sober." Truly, legal jugglers can make black appear to be white.

In the *Practitioner* for April, 1945, Prof. Sydney Smith, in an article "Alcohol and Road Accidents," aptly states "that if the definition of a number of States in the U.S.A. were adopted in this country, namely: 'If the ability of a driver has been lessened in any degree by the use of intoxicating liquors, then the driver is assumed to be under the influence of intoxicating liquor'—then the problem of suitably dealing with the drinking driver would be greatly simplified." The enormous waste of time and nervous energy in attempting to help the police in such cases is utterly futile. At present the law is defeating its own ends, so far as protecting the public is concerned, for even if an individual is practically insensible from drink, I believe that under the present ruling he will still obtain an acquittal.

I have informed the chief constable of the county in which I practise that I cannot in future undertake the examination of persons so charged, and I doubt very much whether he will obtain the services of any other doctor to undertake these exami-

nations under existing circumstances. Blood and urine examinations to ascertain the percentage of alcohol in the blood and urine respectively might be used, but these are of only relative importance, and before taking such specimens the consent of the individual must be obtained, which in all probability would not be given. The whole procedure is becoming a farce, especially in view of the enormous increase in motor traffic which may be confidently anticipated when petrol rationing comes to an end.—I am, etc.,

Alresford, Hants. C. E. MERYON.

Doctors and the Social Trend

SIR,—It may be remembered that on more than one occasion in the past I have endeavoured to emphasize the very wide nature of the present social impulse that is making itself felt in the medical profession. We, like many another institution, had for some time toyed with a plan of reform, and possibly one day such plans might have culminated in a few quite desirable changes of procedure. But to-day the motive force is not provided by a few restless consciences within our ranks. It is, as I have pointed out previously, nothing less than a world force; and the world, this country, and its medical profession require men who can direct its energy rather than spend their strength against it.

Unfortunately the life of a medical man is often much too detailed and specialized to permit a dynamic sense of his position. Many doctors (e.g., Dr. Guy Bousfield, *Supplement*, July 28, p. 18) still seem to cherish the idea that reform of the health services should be designed primarily to meet the wishes of the medical profession, and that the demands of any wider democracy upon their services should be resisted by a sort of medical "junta." And that rather unrealistic and short-sighted attitude is by no means confined to the rank and file. It would appear likely that much of our heritage has been irretrievably frittered away by those of our leaders who failed to recognize the weight of the present social avalanche. The chance to compromise with the more moderate elements has now gone, and we must face the prospect of a far more rapid evolution at the hands of a Government that cannot be expected to feel at all sympathetic with our professional interests.

At the General Election thousands of people like myself voted Conservative in the hope of preserving a stable and wise leadership at home and abroad which might smooth the action of the social upheaval on this country. It is a measure of the force of that social upheaval that such votes were nevertheless completely swamped by its influence on the poll. The electorate is no longer content with a Conservative filtrate of Socialist doctrine. The bulk of our patients now require a health service organized 100% in their interest, and no doubt will refuse to tolerate any sectional obstruction to the mandate that has been given to their leaders for this purpose. That is not to say that the design of the new health services has been removed entirely out of our hands. On the contrary, it is obvious that our co-operation will still be sought and valued. But it will have to be co-operation now and avoid all appearance of being a sort of rearguard action to enable the main body to escape with the valuables.

Obstructionist talk and writing are highly detrimental to our interests, and much public sympathy has already been forfeit in this way. The medical profession is the servant of the public in fact as well as ethical theory, and suggestions that the wishes of a majority of doctors in or out of the Services should be paramount are most harmful. Our leaders must be prepared to co-operate and sympathize with the aspirations of this Government or be prepared to give place to others who will do so. Defiance of a democratic Government by a small minority is not practical politics. The only course, therefore, is to exhibit a co-operative spirit and make a genuine endeavour to give the public the best possible chance of trying out the type of health service it elects to institute. If this Government was convinced that it had to deal with medical men imbued with that spirit it would in turn feel a much greater readiness to sympathize with their views. We may even have to face a salaried service now, but an adequate salary would go a long way towards making that supportable to its most vehement opponents. The average patient is not averse to the payment of his doctor, and may be expected to support reasonable demands for compensation or payment for any service he requires. Such things as that are not to be sacrificed lightly, and indeed any mutually constructed service will almost certainly prove to be a better thing for everyone than anything that could result from the unconditional surrender of the medical profession after a tussle with the country as a whole.

No one can now fail to discern the signs of the times. The country is possessed by an idea for the realization of which it has repudiated its greatest hero in the hour of his triumph over our enemies. The ablest leaders must march ahead of opinion. Let no one therefore suppose that by lagging behind he can obstruct the course of events, or that the medical profession can any longer defy a force that has swept Mr. Churchill aside.—I am, etc.,

Eye, Suffolk. J. SHACKLETON BAILEY.

The Special Treatment Centre

SIR,—I have read in the Parliamentary notes in the *Journal* of June 23 (p. 890) the report made by the Minister of Health upon the arrangement and working of the medical services in England in the weeks following D-Day. There is no doubt that great things were achieved and that a remarkable nation-wide organization showed that it could work well when it was required.

One of the points made by the Minister was to the effect that the opportunity was taken to put into operation a scheme to classify different types of injury, and to send those suffering from them to prearranged centres, established up and down the country, for treatment. Apparently in the conditions present at the time the arrangements proved satisfactory, and it seems certain that many of the planners in our midst will take this as an argument in favour of setting up special centres in widely separated parts of the country in peacetime for the treatment and diagnosis of certain diseases. This is a letter from one who has had the opportunity of seeing some of the effects of this form of regionalization and has suffered under it himself; it is a plea that much thought should be given to the matter before any action is taken.

Of first importance is the fact that all regionalization of medical services in the above sense must, of necessity, be largely for the convenience of the organization and not for that of the patient, no matter what safeguards are introduced. The patient would always rather be treated in his home town or home area if he cannot be left at home. If he has to go far afield to a special centre he will go unwillingly in most cases, and will want to know why the service cannot come to him. The only answer he can have is that it is more convenient for the organization. This feeling would not, of course, apply to men wounded in France for whom anywhere in England is home: only later when they may find themselves retained in a special centre in a strange part of the country does their idea of "home" contract to "home town."

In the Services regionalization of this sort is running away with itself; special centres for various complaints and injuries have been instituted, and patients have often to be sent great distances to them when there are facilities for the proper treatment on the spot and the only thing lacking is the "specialist." I, myself, fractured my skull in Holyhead, my home town, and though there were adequate facilities for treatment there it was decided that I must go to Bristol, which happens to be the Naval centre for head injuries. This move was made in spite of my protests, and finally resulted in my travelling to and fro between Bristol and Holyhead to the extent of 1,300 miles in the following six weeks. I am not suggesting that I suffered any harm from this variation of the "absolute rest" treatment which I was ordered by the eminent surgeon who saw me, and who assured me that Bristol was the only place I should get it. In fact my injury was fairly trivial and I had "got away with it" before he saw me. But I do suggest that this is an instance of the organization being put before the patient, and that it showed both how bound the surgeon was by the Service, and how little he could have known of the effect his advice would have on the life of his patient within that Service. In addition I should mention that there was also the expense, which was not negligible, and the separation from my family, which, though I am normally used to that, seemed at the time to be particularly distasteful; these factors were just not considered. All these things

I foresaw and used in argument when it was proposed to send me away, but to no effect; and if I, a doctor, could not save myself, what chance, I thought, could a lay patient have?

Our latest form of regionalization has now taken continents into its scope; cases of tuberculosis arising in the Eastern Theatre are now discharged to South Africa with the excuse that the climate there is beneficial. I was under the impression that the general view held was that the English climate was as good for the Englishman suffering from phthisis as anywhere, and I fancy the real reason for this latest effort is the lack of beds and staff at home. This lack could, however, be overcome very easily if the Services undertook the treatment of their own cases instead of handing them over to others. The Services, with their powers of direction and the appeal which they have to female staff, would have little difficulty in providing for the treatment of all the patients arising within them. But, no doubt, it would be inconvenient, and it is very easy to send the patients to South Africa, where, I do not doubt, they receive the best and kindest of treatment. But this is a tragic betrayal of the patient's real interests, for to a man who has already been away from home for perhaps a matter of years the prospect of being transferred now that he is ill to a strange country for an unknown length of time and always with the possibility of his dying there is terrifying. This, together with the fact that he has little say in the matter, leads to a state of mind which is not helpful to recovery.

Of course there is another side to the matter: there will never be enough specialists to have one available everywhere, and having the few there are in special centres does make them available, on paper anyhow, to everybody. By specialist I mean, in this instance, the man who has seen so much of one disease (or group of diseases) that he can recognize it by its bark and can treat it almost with his eyes shut. But I very much doubt whether these men contribute a very great amount to the sum total of medicine, and it is by no means certain that to force patients to go and stay long distances away in order to place them under the care of these men will contribute much to the sum of human happiness, nor will it save many from the grave before their time.

At the moment the special-centre enthusiasts appear to want to embrace almost all but the most elementary medical practice, and unless we can put the brake on this enthusiasm we shall all be caught up in the net. Medicine will then lose much of its humanitarian interest, for who can be interested in the unit which must be sent here for that and there for this? In addition we shall find ourselves fearful of making this or that diagnosis which we know will mean the removal of the patient from his home and the break-up, although temporarily, of his family—that is, of course, always supposing that he will go to the centre for his disease.—I am, etc.,

GUY ROWORTH,
Surg. Lieut.-Cmdr., R.N.V.R.

Universities and Colleges

UNIVERSITY OF LONDON

John Yudkin, M.D., Ph.D., has been appointed to the University Chair of Physiology tenable at King's College of Household and Social Science as from Oct. 1.

UNIVERSITY OF GLASGOW

Leslie John Davis, M.D., F.R.C.P.Ed., senior lecturer in the Department of Medicine in the University of Edinburgh, has been appointed to the Muirhead Chair of Medicine in the University of Glasgow as from Oct. 1, in succession to Prof. A. W. Harrington, M.D.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on Aug. 2, with Sir Alfred Webb-Johnson, President, in the chair, a Diploma of Fellowship was granted to Raymond Alexander King. Diplomas of Membership were granted to D. A. N. Barran, A. V. G. Bibby, D. G. Evans, P. M. R. Hemphill, G. F. Jolly, R. A. J. Pearce, E. J. M. Weaver, and to the 130 successful candidates whose names were published in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Aug. 11 (p. 201); as were the names of the five successful candidates for the Diploma in Public Health. Diplomas in Medical Radiology and in Ophthalmic Medicine and Surgery were granted, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN MEDICAL RADIOLOGY.—R. A. Andrews, K. C. Falkner, R. M. Hall, T. M. Young.

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.—D. Ainslie, F. J. Daniato, A. J. Elliot, H. C. Kodilinye, J. M. Loftus, P. J. McNicholas, L. H. G. Moore, J. C. Mustardé, T. H. Negus, A. K. Pittman, D. Shorten, R. Vaughan-Jones.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council, held on July 28, Mr. Eardley Holland was re-elected President to take office in October next. The following officers were also elected: *Vice-Presidents:* Profs. D. Dougal and R. Marshall Allan. *Honorary Treasurer:* Mr. W. Gilliatt. *Honorary Secretary:* Mr. G. F. Gibberd. *Honorary Librarian:* Mr. F. W. Roques. *Honorary Curator of Museum:* Mr. A. W. Bourne.

The following candidates were elected to the Membership: T. M. Barnett, A. Buchan, Daphne Wai Chan Chun, Aileen M. Dickins, E. D. Y. Grasby, M. W. Hemans, Ursula M. Lister, Agnes M. D. Milne, Abd-El-Salem M. El-Minabbawy, K. Mitra, Joan P. Moignard, P. Raj, W. B. Shute, Beatrice M. Smyth, J. M. Thomson.

Medico-Legal

A SEAMAN'S RIGHT TO TREATMENT

If a merchant seaman reasonably believes his health is endangered by illness for which he can only be properly treated ashore, he may go ashore for the treatment even in disobedience of his captain's orders.

An assistant cook in a merchant steamer carrying troops complained to the ship's doctor of spasm in the right thigh muscles. About a fortnight later he complained of pain in one ear. By the time the ship reached Durban three months later both complaints had become worse and he was dissatisfied with the treatment given by the ship's doctor. The man went ashore and consulted of his own accord the port health officer, who sent him to two private doctors, one for his leg and the other for his ear. He also signed a letter to the captain of the ship, but this never reached the captain. Both the private doctors sent the man to a radiologist. He obtained from the ship's agents an authority to be radiographed; copies of the radiologist's reports were sent to the ship's agents and handed by them to the captain, who promptly started inquiries. The otologist, according to the man's statement later, said he must go to hospital for immediate operation, but that he must obtain a note from the ship's doctor allowing this to be done. When the man told the ship's doctor of this, the doctor, who had authorized neither the *x*-ray examination nor the consultation with the otologist, was not satisfied. He met the man at the otologist's surgery, and after a consultation the otologist told the man that the operation could wait until the ship returned to Liverpool. The man was not satisfied with this opinion and went back to the port medical officer, who also was not satisfied and sent the man to a third doctor. This doctor found the man definitely ill and in need of urgent attention to prevent infection spreading from the mastoid to the brain. He arranged for the man to see him next day so that he could make arrangements for his admission to hospital. Next day, however, the captain sent for the man and, after inquiry, ordered him to return to duty pending investigation. The man retorted that he proposed to go ashore and that the captain could not keep him on board. Shortly afterwards he went ashore, and was duly operated on and discharged about ten days later, certified as fit to travel but not to work. He did not inform anyone aboard the ship that he was in hospital; the hospital informed the ship's agents, but the ship had by then sailed. The captain detained the man's effects which he had left aboard the ship, and entered in the ship's log a statement that the man had deserted the ship at Durban.

When the man returned to England he sued the owners of the ship for a declaration that he was not a deserter, for the return of his belongings or their value, for wages, for breach of statutory duty to obtain a certificate from the shipping master entitling the captain to leave the man behind, and for libel. Mr. Justice Lynskey said[1] that to commit desertion a seaman must completely abandon his duty without justification. He took the view that the man, on the advice of the third doctor, thought an operation was imperative and delay might be fatal. He was therefore justified in taking the necessary treatment and not returning to his ship. Both the captain and the purser sent in evidence that if they had known he was in hospital they would have paid him off and not treated him as a deserter. A deserter forfeits wages and his belongings which he leaves on board, but this man, not being a deserter, was entitled to

[1] Moore *v.* Canadian Pacific Steamship Co., 1945) 1 All E.R. 128.

the return of his effects or £140 (their estimated value), to £20 general damages, and to his agreed wages up to the date he went ashore.

Concerning the breach of statutory duty, the Merchant Shipping Act, 1906, forbids a master of a British ship to leave a seaman behind at any place abroad unless he previously obtains the certificate of the proper authority stating the cause. The captain agreed that he did not obtain such a certificate, and said that in practice this provision is ignored because no one knows whether a man is a deserter or not until the ship has sailed, and to obtain a certificate would mean holding the ship up for hours, if not longer. The judge found that the section imposes an absolute statutory duty which can only be altered by Parliament; but as the man had already been fully compensated he merely awarded under this head nominal damages of 1s. On the question of libel, no doubt the words written in the log were defamatory, but they were written and published on a privileged occasion. Under the Merchant Shipping Act, 1894, a master must make entries in the log, and if he leaves a man behind he must state whether the cause is desertion, inability to proceed to sea, or disappearance. The judge was satisfied that the captain had received no information from the hospital, the ship's agents, the purser, or the doctor; he only knew that the man had had two *x*-ray photographs taken and had defied his orders to remain on board and had not come back; he had made the entries in his log in good faith and the firm belief that they were true. The man therefore failed in his claim for libel and had to set off its costs against those paid by the company on his successful claims.

Obituary

LADY BARRETT, C.H., C.B.E., M.D., M.S.

Lady Barrett, consulting obstetric and gynaecological surgeon to the Royal Free Hospital, died at the age of 78 on Aug. 7. She was the widow of Sir William Barrett, F.R.S.

Florence Elizabeth Perry was born in Bristol in 1867, and, after being educated privately, decided in her early teens to take up a medical career. She studied at University College, Bristol, and the Royal Free Hospital, London. After matriculating at London University in 1893, she took her B.Sc. in 1895. She qualified in 1900, took the M.S. in 1904, and the M.D. two years later. At the Royal Free she acted as assistant anaesthetist, ophthalmic assistant, house-surgeon, clinical pathologist and assistant pathologist, surgical and gynaecological registrar with charge of the *x*-ray department, and clinical gynaecological assistant and anaesthetist. In 1908 she was appointed assistant physician for diseases of women, and from 1913–21 was lecturer in midwifery. Lady Barrett was also consulting obstetric surgeon to the Mothers' Hospital at Clapton, and honorary surgeon to the Marie Curie Hospital; she was Dean and later President of the London School of Medicine for Women. She wrote extensively on her specialty, including such subjects as "A Plea for the Feeding of Nursing Mothers as a Means of Preventing the Waste and Maiming of Child Life" and "Conception Control." This most distinguished medical woman served on a large number of committees concerned with social problems and the part played in them by women. Before the last war she was most active in starting voluntary centres in London for the feeding of expectant mothers and children.

Sir William Barrett, whom she married in 1916, was her second husband, and Lady Barrett shared with him his great interest in psychic research; after his death she in part published, in the book entitled *Personality Survives Death*, the record of sittings held with Mrs. Leonard.

Lady Barrett played an active part in the work of the B.M.A., being vice-president of the Section of Obstetrics and Gynaecology at the Annual Meeting at Newcastle-upon-Tyne in 1921, and president of the Section at the Bath Meeting in 1925. She served on the Committee on Causation of Puerperal Morbidity and Mortality in 1927–8, and also on the Parliamentary Subcommittee in 1921–7.

Dame LOUISE MCILROY writes:

Lady Barrett's death will be mourned by a large circle of friends and by those who were associated with her professional work. She had the gift of making and keeping friendships, owing to her loyalty and her charming personality. This gifted woman was a shining example to all medical women, as she combined delightful feminine attributes with those of a skilled surgeon and expert organizer in all matters pertaining to medical education. With the help of Sir George Newman, she was mainly instrumental in obtaining the obstetric unit for the Royal Free Hospital. She held the opinion that a thorough knowledge of obstetrics should be the basis of general practice as well as that of the specialist. She acted as consultant to the unit, and her relationship with the staff was always of the most harmonious nature. She freely gave advice from her wide experience not only of medical problems but of administration. As Dean of the London School of Medicine for Women her help was always available for the benefit of the students, and she gave her sympathetic advice in difficulties of study and the choice of future careers. Perhaps one of Lady Barrett's outstanding characteristics was her great courage in expressing her opinions as to what was just and right. As a distinguished speaker she was much sought after on platforms where discussions took place concerning the interests and health of women and children. She had a long vision of what should be of benefit in the way of public health reforms. She had a great sense of humour, and a happy infectious smile when amused. Her home life with her husband, Sir William Barrett, a distinguished physicist, was of the happiest. With him she studied spiritualism, and in quiet talks in their home one was given a privileged insight into a world different from that of everyday medical life. Theories were expounded by those possessed of deep scientific knowledge. Faiths and beliefs were discussed with an interest which was profound. Scientists, approaching the subject with a broad outlook, cleared up and displaced fallacies. Lady Barrett was a perfect hostess and loved entertaining her friends. She kept in touch with medical women's interests abroad, and she attended international congresses of medical women, where we were all very proud to feel that we had such a distinguished representative and charming speaker. She was always keen on any effort for the furtherance of knowledge of the cause and cure of cancer, and was a valuable member of the staff of the Marie Curie Hospital. Lady Barrett has been a shining example to all medical women on account of her good work and precious comradeship. We say farewell to her with sorrow in our hearts.

SIR THOMAS JONES, M.R.C.S., L.R.C.P.

Sir Thomas Jones, chairman of the Anglesey Education Committee, has died at the age of 74. He was born in 1870 at Llanddeusant, Anglesey, and was educated at the Liverpool Institute and Queen's College, Manchester. After qualifying M.R.C.S., L.R.C.P., and L.S.A. in 1896 he settled down in practice in Amlwch. He was subsequently medical officer of health for Twrcelyn R.D.C. and Amlwch U.D. Sir Thomas Jones was always interested in public work, and had been a member of the Anglesey County Council since 1902; he was chairman from 1913–15, and was later elected Alderman. Since 1919 he had been chairman of the Education Committee, and was active in advocating the provision of hot milk and meals in schools. He was a member of the Council of the Welsh National Memorial Association from its foundation, and from 1911 had been a member of the committee of the North Wales Mental Hospital, and chairman since 1938. He was also chairman of the Mental Hospitals Association in 1942–3, being the first Welshman to occupy the post.

In spite of his numerous public appointments, Sir Thomas Jones had an exceptionally large practice, and will be greatly missed by a wide circle of friends and patients in the island county. He joined the B.M.A. shortly after qualification, and was at one time chairman of the North Caernarvonshire and Anglesey Division; he was president of the North Wales Branch in 1935 and 1936.

Dr. WILLIAM PORTER, who died on June 10, was the senior doctor in active practice in North-East Ulster; he had been in general practice in Portrush, his native town, for over 45 years. He qualified M.B. at the old Royal University of Ireland in 1897, and M.D. in 1908. He was a trustee of Coleraine Cottage Hospital, where he did a good deal of surgery, and was M.O.H. for Portrush and medical officer of the Dispensary. He was often called in by his colleagues over a wide area to give a second opinion, and he was the "doctors' doctor" in his district, many of them seeking his advice on their own health and that of their families. Always an active member of the B.M.A., which he joined in 1900, he was president of the Ulster Branch in 1927–8, secretary of the Ballymoney Division from 1922 to 1927, and chairman of the Division in 1927–8. Yachting was his main recreation, and for many years he spent his holidays cruising round the Scottish Coast. He was keenly interested in the work of the R.N.L.I., and once during the last war he inspired a volunteer crew of the local lifeboat by

putting out to sea on an exceptionally rough night; a fierce gale was blowing, and conditions were so bad that many considered it unsafe for the boat to leave harbour. He is survived by his widow, a daughter of the late Dr. Johnston, of Belfast, one daughter, and two sons—Major Robert J. Porter, R.A.M.C., formerly attached to the London Hospital, and Mr. Hector Porter, who practises in Edinburgh.

Capt. DAVID IRVING ANDERSON, O.B.E., R.A.M.C., who died on July 25, was born on May 20, 1881, and received his medical education at the University of Edinburgh, where he graduated M.B., Ch.B. in 1904, taking the certificate in tropical medicine in the same year. After holding the post of clinical assistant in the eye department of the Prince of Wales's General Hospital, Tottenham, he went to Malaya, where he was surgeon to the Johore State and Lower Perak Planters' Association. He returned for service in the R.A.M.C. in the war of 1914–18, attaining the rank of major, and was appointed O.B.E. in 1919. After the war he practised at Ripley, Derbyshire; Pontrilas, near Hereford; Hoddesdon, Herts (from 1920 to 1931, being honorary secretary of the East Herts Division of the B.M.A. from 1928 to 1931); and finally at Ross, Herefordshire, becoming medical officer under the county council and honorary physician to the local cottage hospital. He was employed as a civilian medical practitioner at Hereford Barracks when war in Europe again broke out in September, 1939, and in June, 1940, he was granted a temporary commission as lieutenant in the R.A.M.C., although then 59 years of age, becoming captain a year later. In 1942 he was transferred to the unemployed list.

Dr. C. D. FITCH, who died at his home at Chaddesley Corbett on July 19 at the age of 81, had, like his father before him, practised at Chaddesley for 40 years. Educated at Aldenham School, Herts, and at Queen's College, Birmingham, Charles Dennis Fitch qualified M.R.C.S., L.S.A. in 1885, afterwards becoming obstetric and ophthalmic house-surgeon at Queen's Hospital, Birmingham. He was fond of a number of outdoor pursuits, being a keen gardener, a sound cricketer, an ardent shot, and an acute observer of Nature, especially of bird life. But his greatest pleasure was in hunting and in point-to-point fixtures; he was a follower of the Worcestershire hounds and was a familiar figure at all horse events in the county for many years. He played a large part in village activities throughout his life and was widely respected. He was a churchwarden, a bellringer, and a trustee to the endowed schools, the Foresters, and the almshouses. He had been a member of the B.M.A. for 39 years, and in 1922 was chairman of the Worcester Division. He was a member of the Kidderminster Medical Society. Dr. Fitch retired in 1928. He leaves a son and daughter.

The Services

Temp. Surg. Lieut. A. G. M. Wilson, R.N.V.R., has been mentioned in dispatches posthumously for gallantry and outstanding devotion to duty while serving in one of H.M. ships in escorting convoys to and from North Russia.

Capt. J. A. Peters, R.A.M.C., has been appointed M.B.E. (Military Division) in recognition of gallant and distinguished services in the field.

The following have been mentioned in dispatches in recognition of gallant and distinguished services in North-West Europe: Major-Gen. E Phillips, C.B., C.B.E., D.S.O., M.C., and Col. J. W. C. Stubbs, D.S.O., M.C., late R.A.M.C.; Cols. (Temp.) A. T. B. Dickson, O.B.E., T.D, C. Helm, D.S.O., O.B.E., M.C., J. P. J. Jenkins, T.D., and A. R. Oram, M.C.; Lieut.-Cols. (Temp.) C. Bainbridge, A. Cowie, M. H. Evans, M.B.E., R. Evans, F. F. Hellier, E. H. P. Lassen, D. J. MacMyn, T.D., G. A. G. Mitchell, and R. E. Tunbridge, O.B.E.; Majors (Temp.) R. Barraclough, J. Bleakley, J. A. C. Burridge, G. B. Carter, N. J. Crawford, H. B. L. Dixon, C. M. Elliott, W. Halliday, K. N. A. Herdman, P. W. Hunt, W. F. Mair, D. D. Maitland, N. H. Martin, D. I. McCallum, M.C., R. M. McGregor, D. J. Paddison, J. B. Shaw, J. E. Talbot, H. R. Thompson, R. S. Thompson, H. L. Thornton, J. C. Watt, K. S. Wilson, and H. L. Wolfe; Capts. J. T. Anderson, R. D. Chalmers, J. J. Cruickshank, J. Dawson, R. Dobson, J. S. Hollingsworth, A. C. Houghton, H. J. C. J. L'Etang, A. T. Macknight, (Miss) R. M. Marwick, S. A. Mason, R. S. McGeorge, C. N. Mills, B. B. Milstein, J. M. Scott, M. H. Sherwell, R. T. Thin, and C. R. Wright; Lieuts. A. O. Harries, M.C., and W. Mills, R.A.M.C.; Lieut.-Col. G. C. Ferguson; Majors R. Blais, H. I. Palmer, and A. E. Thoms, M.B.E.; Capts. (Acting Majors) F. S. Brien, C. C. Misener, and C. L. Pearson; Capts. T. A. Laidlaw, P. Bernstein, N. N. Levine, H. A. Roberts, and R. G. Winram; Lieut. N. A. Riley, R.C.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES

Surg. Lieut.-Cmdr. GERALD NOEL MARTIN, R.N.V.R., the fourth son (all of whom entered the medical profession) of the late Dr. John Wise Martin of Sheffield, died on June 30 at the age of 59, after an operation and a very short illness at the Royal Naval Hospital, Plymouth. He was educated at Sheffield and the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1913, and then held a house post at the Royal Sussex County Hospital, Brighton. His great love was for the sea, however, and he spent many years afloat, both in the Royal Navy and the Merchant Navy. In the war of 1914-18 he served throughout in the Royal Navy, and was in the water 2½ hours when the *Aboukir*, the *Cressy*, and the *Hogue* were torpedoed in September, 1914. When war in Europe broke out in September, 1939, he soon secured a transfer from the Merchant Navy, in which he had been serving, to the Royal Navy. Again he was on board a ship which was torpedoed and spent a night in a small lifeboat in the Atlantic, during which time he controlled a tourniquet on a seriously injured sailor. His service was spent in all kinds of vessels, from superbattleships to monitors, down to the *Discovery*, which was sent on an expedition to rescue Sir Ernest Shackleton. At the time of his illness he was engaged on work in connexion with the demobilization of naval personnel. He was given a Service funeral, with full naval honours. His loss is keenly felt by a great number of friends, both in the Service and out of it, nearly all of whom are members of the medical profession.

Missing, presumed killed.—Temp. Surg. Lieut. Ross McFaul Kirkpatrick, D.S.C., R.N.V.R.

Medical News

Major Basil H. H. Neven-Spence, M.D., F.R.C.P.Ed., who was re-elected M.P. for Orkney and Shetland at the recent General Election, received a Knighthood in the Resignation Honours List published on Aug. 13.

A short memorial service for Dr. Gordon Pugh will be held in the chapel at Queen Mary's Hospital, Carshalton, on Friday, Aug. 31, at 2.30 p.m.

On Aug. 8 a new kitchen suite was opened at the London Hospital, where a large basement ward has been converted for the purpose at a cost of approximately £7,000. The suite is equipped with labour-saving appointments and modern facilities for cooking, and care is taken in the presentation of food to both the patients and the staff. Sir Wilson Jameson, Chief Medical Officer of the Ministry of Health, congratulated the hospital on the lead it had given in hospital catering, and expressed the hope that other hospitals would follow its example.

The council of the Guild of St. Luke, SS. Cosmas and Damian, at a meeting on June 7, decided that the Guild should resume activities, and arrangements are being made for meetings of all branches to be held in the forthcoming session. Publication of the Guild's *Journal* is also to be resumed at the earliest opportunity. Subscriptions will become due when the new session opens, and application will be made for them by the Treasurer.

The Central Co-operative Anti-Malaria Society, Ltd., celebrated in December, 1944, the 25th year of its existence, under the presidency of Mr. L. K. Elmhirst, Agricultural Adviser to the Government of Bengal. In a special message to the society Mr. R. G. Casey, the Governor of Bengal, said: "By mobilizing popular support in the fight against malaria, and by stimulating interest in preventive measures, you are undertaking a task which is in accordance with the highest ideals of public service, and I wish you every success in your future efforts."

Mr. Basil Hughes, F.R.C.S., has resigned his position of honorary surgeon to the Bradford Royal Infirmary and to St. Luke's Municipal Hospital, Bradford, on his retirement from practice. Mr. Hughes's association with Bradford began in 1911, when he was appointed resident surgical officer at the Royal Infirmary.

It will be recalled that in 1941 the shortage of supplies necessitated the making of Orders by the Minister of Health and the Secretary of State for Scotland which limited the use of liquid paraffin in emulsions to not more than 25% by volume. As supplies have now improved these Orders have been revoked as from July 26, 1945.

The Medical Women's Federation will be glad to hear from medical women who, on demobilization from the Services, are faced with any difficulty on re-entering civilian life on which they desire advice. The Federation can loan money on easy terms in sums up to, say, £100, to suitable applicants who contemplate doing post-graduate study, or who wish to undertake medical work which involves monetary outlay. All inquiries should be addressed to the Secretary, Medical Women's Federation, 73, Bourne Way, Hayes, Bromley, Kent.

In future Service men and women who need sanatorium treatment for tuberculosis will be retained in the Services for a period not exceeding eight months from the date of their first absence from duty on account of the disease. This postponement will benefit the person concerned from the standpoint of his Service rights and privileges.

The National Institute for the Blind is sending an expert, Mr. Eric Boulter, to Greece to conduct a survey for the Greek Government of the special rehabilitation needs of the blind—both those who were born blind and those who have been blinded during this war. This visit has been arranged by U.N.R.R.A., to whom Mr. Boulter has been lent for two months. It is part of a rehabilitation programme in which U.N.R.R.A. is actively taking part in Greece. As a result of the 1940–1 war and the recent fighting there is a great problem in caring for and rehabilitating casualties; not only soldiers, but the many civilians and children who have been disabled by the war devastation in Greece. The Greek Government is fully aware of the size of this problem, and the urgent need to tackle it. The Ministries of War and of Health and Welfare, which are the responsible bodies, have asked U.N.R.R.A. for advice and assistance. The Director of Health of the U.N.R.R.A. mission is Dr. J. Kirk.

Sir Lawrence Bragg was present at a ceremony at Leeds University on July 20, when a tablet paying tribute to his father and himself was unveiled in the vestibule of the Brotherton Library. The inscription reads: "Near this place, in the old Physics Laboratory, in the year 1913, William Henry Bragg, Cavendish Professor of Physics in this University from 1909 to 1915, and his son, William Lawrence Bragg, began their joint researches and established with the first *x*-ray spectrometer the nature of *x*-ray spectra and the principles of crystal analysis, for which they were awarded the Nobel Prize in 1915." The tablet was presented by Mrs. Smithells, widow of Prof. Arthur Smithells, former professor of chemistry at the University. Prof. Smithells was a close colleague of Sir William Bragg, and it was his wish that the tribute should be made. During the ceremony Sir Lawrence presented to the University one of Sir William Bragg's original notebooks.

Mr. Arthur Selby McCrea, of Warley House, Halifax, who died on Feb. 26, aged 91, bequeathed his mansion at Warley, with an endowment of £50,000, to the Royal Halifax Infirmary.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week notifications of measles fell by 894 cases, diphtheria by 74, whooping-cough by 66, scarlet fever by 31, and dysentery by 23.

The trend of whooping-cough notifications showed little change, except for relatively large declines in Cornwall (35 fewer) and Lancashire (27 fewer). The notifications of diphtheria were the lowest ever recorded, and 28 fewer than the previous low level recorded last summer. During the week a fall in incidence was recorded in every county except Lancashire and Yorkshire, where the incidence remained almost stationary. An increase of 42 in the notifications of measles in Suffolk was the only sizeable exception to the general fall in incidence. The largest returns for dysentery were Lancashire 38, London 24, Warwickshire 23, Essex 21, Middlesex 17, Surrey 15, Lincolnshire 11.

In *Scotland* there was a rise of 33 in the notifications of dysentery, and a fall of 36 in those for scarlet fever. The only new outbreak of dysentery was in Ayr County, 16 cases, and the largest increases were in Aberdeen County, from 2 to 14, and in Glasgow, from 10 to 21.

In *Eire* the only changes of any size in the returns occurred in Dublin C.B., where 63 cases of infantile diarrhoea and enteritis, and 42 of whooping-cough, were notified.

Scottish Vital Statistics

The preliminary statement by the Registrar-General for the second quarter of the year shows that the birth rate has continued to fall, and at 17.5 per thousand was the lowest rate recorded for a June quarter. The marriage rate has risen to 9.6 per thousand, and was the highest rate for any quarter since the first quarter of 1942. The death rate, 11.9 per 1,000, was slightly above the corresponding quarter of 1944, but with that exception was the lowest for any second quarter.

Week Ending August 4

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,232, whooping-cough 1,072, diphtheria 360, measles 2,190, acute pneumonia 234, cerebrospinal fever 39, dysentery 324, paratyphoid 3, typhoid 7, poliomyelitis 21.

No. 30

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 28.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	42	6	23	—	4	43	3	22	2	2
Deaths		2	—				—	—		
Diphtheria	370	26	105	72	13	461	20	111	76	18
Deaths	4	—	1	—	—	6	1	2	2	1
Dysentery	226	24	77	—	—	149	15	86	—	1
Deaths				—	—				—	—
Encephalitis lethargica, acute	1	—	—	—	—	1	—	1	1	—
Deaths		—					—			
Erysipelas			35	3	4			28	18	—
Deaths		—					1			
Infective enteritis or diarrhoea under 2 years				78					31	
Deaths	38	3	11	21	2	49	9	11	12	1
Measles*	2,581	129	62	32	4	2,352	73	61	86	22
Deaths	1	—	1	1	—	2	—	1	—	—
Ophthalmia neonatorum	63	3	19	—	—	61	6	21	—	1
Deaths										
Paratyphoid fever	7	—	1 (B)	—	1 (B)	11	—	1 (B)	1 (B)	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	322	20	1	—	—	450	17	2	4	5
Deaths (from influenza)	4	—	—	—	—	3	—	—	—	—
Pneumonia, primary			111	9	—			149	5	
Deaths		26		4	4		26		10	2
Polio-encephalitis, acute	—	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	22	5	—	2	4	12	1	5	2	—
Deaths		1					—			
Puerperal fever		5	10		—		7	10		—
Deaths										
Puerperal pyrexia‡	161	14	18	—	—	147	6	9	2	1
Deaths		—					1			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,223	76	155	24	24	1,530	38	147	40	36
Deaths	—	—	—	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	11	3	1	4	1	18	1	2	14	3
Deaths	—	—	—	—	—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,092	55	19	52	14	2,151	129	53	55	9
Deaths	2	—	—	—	—	14	3	1	2	1
Deaths (0–1 year)	247	31	45	38	14	313	35	62	44	17
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	3,512	516	481	183	107	4,190	707	562	204	102
Annual death rate (per 1,000 persons living)			10·9	11·8	§			12·9	13·2	§
Live births	6,871	844	942	397	270	7,089	695	957	419	312
Annual rate per 1,000 persons living			18·8	25·6	§			19·5	27·2	§
Stillbirths	196	22	31			217	14	34		
Rate per 1,000 total births (including stillborn)			32					34		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to movements of population, birth and death rates for Northern Ireland are still not available.

Letters, Notes, and Answers

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ANY QUESTIONS?

Nocturnal Cramp

Q.—*Can anything be done to prevent the onset of nocturnal "cramps" in the feet and legs in a woman of 35? What causes them? A femoral thrombosis has been present in the right leg for over ten years, but the spasms, which are extremely painful, affect either limb and seem to be more likely to follow a day when more walking than usual has taken place. There are no varicose veins.*

A.—The spasm probably results from the presence of the products of muscular metabolism which have not been removed. It might be worth while massaging the muscles before going to bed. A hot bath might be helpful in preventing attacks. The precipitating factor is often postural, and difficult to avoid in sleep. Amyl nitrite might be worth a trial in order to relieve the attack. In any case very little is known about cramp; the condition is hardly conducive to deep personal study, and too fleeting and erratic in other persons.

Carbarsone

Q.—*What exactly is carbarsone, and what are its uses? In what form is it administered, and what is the dosage? Has it been found of use in treating asthma? What are the contraindications, if any, in using it in a case of asthma?*

A.—Carbarsone is *p*-carbamido-benzene arsonic acid. It is closely related to tryparsamide and acetarsone. Its main use is in the treatment of amoebic dysentery. It is marketed in tablets or capsules, and the adult dose is 0.25 g. taken by mouth twice daily for ten days. It is usual to institute a rest of ten days, and then the course of carbarsone may be repeated, and so on. The organic arsenicals are a specific remedy for tropical eosinophilia, and carbarsone has been used in this disease. Tropical eosinophilia, which is characterized by bronchitis, asthma, and a high blood eosinophilia, has been ascribed to infestation of the air passages by mites, though this explanation is not generally accepted. The writer has seen a similar condition arising in this country and responding to organic arsenicals. There is no evidence that organic arsenicals are of any value in the classical type of asthma, and it would not seem desirable to use carbarsone in asthma unless there were at least 2,000 eosinophil leucocytes per c.mm. of blood.

Hiccup in Infancy

Q.—*What are the aetiology and treatment—preventive and curative—of hiccups in the infant? A well-developed male infant 10 weeks old, 8 lb. 7 oz. at birth, now 12½ lb., who has been fed in turn on breast, humanized, full-cream, and again humanized food, hiccups just before and after almost every feed. The usual precautions of temperature, size of teat hole, and sitting the child up well have been attended to. Is it advisable to resort to a starchy food in spite of its supposedly rachitic properties?*

A.—The cause of hiccup in infancy is unknown. Probably the pressure of the full stomach on the diaphragm has something to do with it, and the stomach may be full of food after a meal or full of swallowed air before a meal. It is doubtful if the nature of the food used has anything to do with it, and it is a pity if, as may have occurred in this case, breast-feeding has been discontinued because of the hiccup. As regards feeding in the future, it does not appear to matter what is used, and there is certainly no indication for starchy food. A simple milk and water mixture with added sugar would be best (boiled cow's milk 4 oz., water 1½ oz., sugar 1½ teaspoons). The weight-records suggest overfeeding, and this may have started the tendency to hiccup. The present management suggested is to give the child a sedative (choral gr. 2) 15 minutes before each feed, and to see that the feed is taken in 15 to 20 minutes, with breaks for getting up the "wind" about twice during the feed and again at the end. It is likely that the symptom worries the mother (and doctor?) more than the child.

Effectiveness of Phthalates

Q.—*What is the relative effectiveness as insect repellents of the dimethyl, diethyl, and dibutyl phthalates? What is their relative toxicity to the human if rubbed on the skin? For how long is a skin application effective? Is there any danger to the eyes?*

A.—There is at present no published information on the relative effectiveness of dimethyl, diethyl, and dibutyl phthalates as repellents, and I do not know of any on their relative toxicity to man. None of them is dangerous if rubbed on the skin as directed. While there should be no serious danger to the eyes, all of them are liable to cause considerable smarting if they get into the eye. The duration of effectiveness of skin application will depend on temperature, amount of perspiration, etc., and it may be effective for longer with some insects than others; but in all cases it is a matter of hours.

Penicillin in Ulcerative Colitis

Q.—*Has the treatment of ulcerative colitis by penicillin been investigated, either by colonic washouts with a solution, or otherwise? If so what have been the results?*

A.—It has been asserted categorically in the U.S.A. that penicillin given by intramuscular injection has no effect on ulcerative colitis. Introduced directly into the lumen of the lower bowel, penicillin is rapidly destroyed, since *Bact. coli* and other organisms present there produce an enzyme—penicillinase—which has this effect. It should theoretically be possible to suppress the normal flora with such a drug as succinylsulphathiazole, and thus enable penicillin to persist and exert an action on surviving micro-organisms, but there is no evidence that even this proceeding has any effect on the course of the disease. There is some doubt whether bacterial infection *per se* is the cause of ulcerative colitis, and in any case the nature of this infection is undetermined; there are therefore no good reasons for expecting benefit from treating it with penicillin.

Endometrioma in Small Intestine

Q.—*A married woman of 37 complains of pain in the right iliac fossa, nausea, and constipation. This had occurred in bouts and had allegedly been coming on for "several years." She had one child of 16; no miscarriages; menses 6/20; regular and heavy with bearing-down pains. No frequency of micturition or loss of weight. Physical signs were compatible with acute appendicitis, and I operated. The appendix was normal, but she had a carcinomatously hard swelling, the size of a walnut, in the ileal wall. Resected terminal ileum, caecum, and ascending colon, and carried out an anastomosis of the ileum with the transverse colon. The uterus was symmetrically enlarged to the size of about a two-months pregnancy, but I took this to be an ordinary fibroid condition. She has made an uneventful recovery, but to my surprise the pathologist's report on the resected tumour was: "Shows a deposit of uterine adenomyoma." The tumour was relatively mobile and not fixed to the uterus, or near it. Should the uterus be removed, and, if so, how soon? And what is the prognosis? Will other deposits, if they exist, clear up when the origin is removed?*

A.—This is an interesting example of the occurrence of an endometrioma in the small intestine. The fact that such deposits occur is not generally known, though gynaecologists have for some time been discussing and writing on the subject. Any such deposit of an endometrioma will clear up completely if the ovarian activity be destroyed, either by removal of the ovaries surgically or by the administration of a castration-dose of *x* rays. In this case, therefore, there should be no need to advise the removal of the uterus.

Dermatitis of Navel

Q.—*A married woman aged 42 has for the past 8 months had a dermatitis of the navel. The condition is confined to the small area of skin inside the navel orifice, and goes through a regular cycle of desquamation when a thick layer of epithelium separates, leaving a pink, moist surface and slight serous discharge. Any treatment so far tried makes little difference.*

A.—This may be a local infective condition, and fractional doses of *x* rays and the following ointment would help:

Acid. salicyl.	.. .. ..	gr. 5
Gentian violet	.. .. ..	gr. 2½
Halden's emulsifying base Paraff. moll.	.. ..	āā ad ℥j

Ft. ung.

It may be a local expression of a general disturbance, probably seborrhoeic eczema or psoriasis. In that case attention to general factors—endocrine, metabolic, or focal infections—will also be necessary.

Alkaline Tide in Urine

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Letters, Notes, and Answers

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ANY QUESTIONS?

Nocturnal Cramp

Q.—*Can anything be done to prevent the onset of nocturnal "cramps" in the feet and legs in a woman of 35? What causes them? A femoral thrombosis has been present in the right leg for over ten years, but the spasms, which are extremely painful, affect either limb and seem to be more likely to follow a day when more walking than usual has taken place. There are no varicose veins.*

A.—The spasm probably results from the presence of the products of muscular metabolism which have not been removed. It might be worth while massaging the muscles before going to bed. A hot bath might be helpful in preventing attacks. The precipitating factor is often postural, and difficult to avoid in sleep. Amyl nitrite might be worth a trial in order to relieve the attack. In any case very little is known about cramp; the condition is hardly conducive to deep personal study, and too fleeting and erratic in other persons.

Carbarsone

Q.—*What exactly is carbarsone, and what are its uses? In what form is it administered, and what is the dosage? Has it been found of use in treating asthma? What are the contraindications, if any, in using it in a case of asthma?*

A.—Carbarsone is *p*-carbamido-benzene arsonic acid. It is closely related to tryparsamide and acetarsone. Its main use is in the treatment of amoebic dysentery. It is marketed in tablets or capsules, and the adult dose is 0.25 g. taken by mouth twice daily for ten days. It is usual to institute a rest of ten days, and then the course of carbarsone may be repeated, and so on. The organic arsenicals are a specific remedy for tropical eosinophilia, and carbarsone has been used in this disease. Tropical eosinophilia, which is characterized by bronchitis, asthma, and a high blood eosinophilia, has been ascribed to infestation of the air passages by mites, though this explanation is not generally accepted. The writer has seen a similar condition arising in this country and responding to organic arsenicals. There is no evidence that organic arsenicals are of any value in the classical type of asthma, and it would not seem desirable to use carbarsone in asthma unless there were at least 2,000 eosinophil leucocytes per c.mm. of blood.

Hiccup in Infancy

Q.—*What are the aetiology and treatment — preventive and curative—of hiccups in the infant? A well-developed male infant 10 weeks old, 8 lb. 7 oz. at birth, now 12½ lb., who has been fed in turn on breast, humanized, full-cream, and again humanized food, hiccups just before and after almost every feed. The usual precautions of temperature, size of teat hole, and sitting the child up well have been attended to. Is it advisable to resort to a starchy food in spite of its supposedly rachitic properties?*

A.—The cause of hiccup in infancy is unknown. Probably the pressure of the full stomach on the diaphragm has something to do with it, and the stomach may be full of food after a meal or full of swallowed air before a meal. It is doubtful if the nature of the food used has anything to do with it, and it is a pity if, as may have occurred in this case, breast-feeding has been discontinued because of the hiccup. As regards feeding in the future, it does not appear to matter what is used, and there is certainly no indication for starchy food. A simple milk and water mixture with added sugar would be best (boiled cow's milk 4 oz., water 1½ oz., sugar 1½ teaspoons). The weight-records suggest overfeeding, and this may have started the tendency to hiccup. The present management suggested is to give the child a sedative (choral gr. 2) 15 minutes before each feed, and to see that the feed is taken in 15 to 20 minutes, with breaks for getting up the "wind" about twice during the feed and again at the end. It is likely that the symptom worries the mother (and doctor?) more than the child.

Effectiveness of Phthalates

Q.—*What is the relative effectiveness as insect repellents of the dimethyl, diethyl, and dibutyl phthalates? What is their relative toxicity to the human if rubbed on the skin? For how long is a skin application effective? Is there any danger to the eyes?*

A.—There is at present no published information on the relative effectiveness of dimethyl, diethyl, and dibutyl phthalates as repellents, and I do not know of any on their relative toxicity to man. None of them is dangerous if rubbed on the skin as directed. While there should be no serious danger to the eyes, all of them are liable to cause considerable smarting if they get into the eye. The duration of effectiveness of skin application will depend on temperature, amount of perspiration, etc., and it may be effective for longer with some insects than others; but in all cases it is a matter of hours.

Penicillin in Ulcerative Colitis

Q.—*Has the treatment of ulcerative colitis by penicillin been investigated, either by colonic washouts with a solution, or otherwise? If so what have been the results?*

A.—It has been asserted categorically in the U.S.A. that penicillin given by intramuscular injection has no effect on ulcerative colitis. Introduced directly into the lumen of the lower bowel, penicillin is rapidly destroyed, since *Bact. coli* and other organisms present there produce an enzyme—penicillinase—which has this effect. It should theoretically be possible to suppress the normal flora with such a drug as succinylsulphathiazole, and thus enable penicillin to persist and exert an action on surviving micro-organisms, but there is no evidence that even this proceeding has any effect on the course of the disease. There is some doubt whether bacterial infection *per se* is the cause of ulcerative colitis, and in any case the nature of this infection is undetermined; there are therefore no good reasons for expecting benefit from treating it with penicillin.

Endometrioma in Small Intestine

Q.—*A married woman of 37 complains of pain in the right iliac fossa, nausea, and constipation. This had occurred in bouts and had allegedly been coming on for "several years." She had one child of 16; no miscarriages; menses 6/20; regular and heavy with bearing-down pains. No frequency of micturition or loss of weight. Physical signs were compatible with acute appendicitis, and I operated. The appendix was normal, but she had a carcinomatously hard swelling, the size of a walnut, in the ileal wall. Resected terminal ileum, caecum, and ascending colon, and carried out an anastomosis of the ileum with the transverse colon. The uterus was symmetrically enlarged to the size of about a two-months pregnancy, but I took this to be an ordinary fibroid condition. She has made an uneventful recovery, but to my surprise the pathologist's report on the resected tumour was: "Shows a deposit of uterine adenomyoma." The tumour was relatively mobile and not fixed to the uterus, or near it. Should the uterus be removed, and, if so, how soon? And what is the prognosis? Will other deposits, if they exist, clear up when the origin is removed?*

A.—This is an interesting example of the occurrence of an endometrioma in the small intestine. The fact that such deposits occur is not generally known, though gynaecologists have for some time been discussing and writing on the subject. Any such deposit of an endometrioma will clear up completely if the ovarian activity be destroyed, either by removal of the ovaries surgically or by the administration of a castration-dose of *x* rays. In this case, therefore, there should be no need to advise the removal of the uterus.

Dermatitis of Navel

Q.—*A married woman aged 42 has for the past 8 months had a dermatitis of the navel. The condition is confined to the small area of skin inside the navel orifice, and goes through a regular cycle of desquamation when a thick layer of epithelium separates, leaving a pink, moist surface and slight serous discharge. Any treatment so far tried makes little difference.*

A.—This may be a local infective condition, and fractional doses of *x* rays and the following ointment would help:

Acid. salicyl.	gr. 5
Gentian violet	gr. 2½
Halden's emulsifying base Paraff. moll.	āā ad 3j

Ft. ung.

It may be a local expression of a general disturbance, probably seborrhoeic eczema or psoriasis. In that case attention to general factors—endocrine, metabolic, or focal infections—will also be necessary.

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Q.—*What is the cause of post-prandial and morning alkaline tide? It is stated by some authorities that post-prandial alkaline tide acts as a compensatory mechanism against the loss of acidity during digestion, but this appears unlikely, as the same phenomenon is witnessed in patients suffering from gastric anacidity.*

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mentioned above; several of my patients have been followed up for over ten years with no further advance of the disease. The value of *x* rays in the benign prostatic field is nearly as great as in the similarly too-little-used field of uterine fibroids. Much of the early bladder trouble is due to spasm or congestion ("edema"—Barringer); these are usually quickly allayed by *x*-ray treatment and operation avoided. All early prostate cases might well have a suitable course of *x*-ray treatment; for in a considerable percentage this would be found to be a prophylactic against further troubles. Pituitary irradiation might help some cases (as in uterine fibroids).

An Eyeless Needle

Dr. WRIGHT LAMBERT (Keighley) writes: In reply to Mr. J. L. Aymard's letter (July 14, p. 74) he may be interested to know that I devised a needle-holder to facilitate threading, and holding, a tubular needle such as he has been using. My description appeared in the *Lancet* of Oct. 21, 1944, p. 536. The holder can be supplied by Down Bros., London, who also supply needles of all calibres and shapes to fit the holder, which will also take an ordinary hypodermic needle.

Prolapsus Ani in a Child

Mr. F. W. M. PRATT, F.R.C.S. (London, W.1), writes: I was interested to read the list of methods of treatment for this condition given in "Any Questions?" (July 21, p. 105). It is really time that most of these methods were forgotten or banished from textbooks. For instance, nothing could be more ineffectual or productive of hysteria in both parent and child than to order defaecation in the lying position. As the writer says, many cases undergo spontaneous cure and need no treatment, but there are also many cases which are persistent and should be given active treatment. I do not think that a psychological state is a common factor; diarrhoea certainly is. The following method of treatment is most effective. Under vinesthene anaesthesia 0.25 to 0.5 c.cm. of absolute alcohol is injected into each quadrant of the anal submucosa through a proctoscope, as in the injection treatment of haemorrhoids. No preliminary enemata or wash-outs are given. I have used this method for about the last eight years, and in nearly every case have had an instantaneous cure. In a very few cases this injection has had to be repeated on one other occasion.

Fox-Fordyce Disease

Dr. JOHN T. INGRAM (Leeds) writes: In my experience Fox-Fordyce disease (Aug. 4, p. 171) is responsive to oestrogen therapy, and responsive to this only.

Visiting at Children's Hospitals

Dr. L. A. PARRY (Hove) writes: A children's hospital is examining the desirability of allowing a daily visit to their children instead of, as at present, twice a week. I shall be very grateful if any children's hospital which has adopted the daily-visit system will give me information as to how it is working, especially in connexion with the incidence of infection, and the psychological effects on the children.

Adder-bites

Dr. T. V. COOPER (Dorchester) writes: In the *Journal* of July 7 there is a question and answer dealing with adder-bites. The answer advises the use of antivenomous serum subcutaneously. Why did not the adviser advocate serum intravenously? Adder-bites are not uncommon in this area. Among Service personnel I have heard of as many as three cases in one day during manœuvres on heath land. At the time of which I speak serum was not available, but I never heard of a fatal issue. Serum is now available on a small scale (see *B.M.J.*, Aug. 4, p. 172). I make a practice of holding a small stock. Under refrigerator conditions I regard, perhaps wrongly, this serum as being potent for use for at least 4 to 5 years, not the one year mentioned in the answer. The Pasteur Institute, who make the serum, give a keeping period exceeding four years. Within the past few weeks I saw an airman home on leave who received an adder-bite while out shooting rabbits, in which a delay of about two hours occurred before he was brought to the hospital; 10 c.cm. of serum intravenously when seen and a further 10 c.cm. four hours later appeared to cut short the systemic symptoms, and he was well enough to go about in four days.

*** Our adviser replies: Calmette in his authoritative work on venoms (1908, p. 263) recommends that the antiserum against snake-bite should be injected into the subcutaneous tissue of the abdomen; on page 265 he remarks: "In cases in which phenomena of serious intoxication have already appeared, and when asphyxia threatens, one must not hesitate to inject 10 or even 20 c.cm. of serum directly into a vein." So there is authority for intravenous injection in urgent cases. As regards the length of time during which the serum remains potent, I gave one year as a conservative figure.—ED., *B.M.J.*

"Doctor" or "Medical Practitioner"?

Dr. C. R. MOORE (Bray) writes: The restrictions on the use of the term "nurse" reported in the *Journal* of July 28 (p. 130) make one wonder how long it will remain customary to use the term "doctor" to connote registered medical practitioner. The latter description satisfies most of us, and it seems hardly in keeping with the dignity and ethics of the profession to be inaccurate.

Active Practice of Medical Women

THREE FINAL-YEAR MEDICAL STUDENTS write: With reference to the large proportion of women taking the medical course—approximately one-third in the final year in our university—it would be of interest to know, on available statistics, how many of these are likely to be actively practising at the end of three or five years after qualifying.

The Shortage of Nurses

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SUPPLEMENT TO THE

BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 18 1945

THE CONSTITUTION OF THE B.M.A.

Before the war the B.M.A. used to publish every autumn an *Annual Handbook*, mainly for the use of Division secretaries. It included lists of officers, an account of the machinery of the Association, and a summary of the policy of the Association on matters that often arose in the course of a Division secretary's work. Owing to shortage of paper and lack of staff publication has had to be suspended during the war, but it is hoped to issue as soon as possible an up-to-date "directory" section. It is also thought that the following summary of the Association's constitution and machinery in the British Isles may be useful to members who have joined during the past six years.

Objects of the Association

The Association has for its objects the promotion of medical and allied sciences and the maintenance of the honour and interests of the medical profession.

General Framework of Constitution

Division.—A Division comprises all the members in a defined area. The Association is in effect a federation of Divisions or local medical societies. For certain administrative purposes Divisions are grouped into Branches.

Representative Body.—Each year Divisions elect Representatives according to their numerical strength, and these form collectively the Representative Body. The Representative Body, which meets annually, is the governing body of the Association and decides its policy.

The Council, which is elected mainly by members in the Divisions and Branches and by the Representative Body, is the central executive body.

The British Medical Journal is the official organ of the Association, and its *Supplement* is one of the main channels of communication between the executive and individual members.

The Division

The vitality of the Association depends to a large extent on the activity of the Division. It works within a defined area, and all members of the Association in that area are *ipso facto* members of the Division. The Division elects its own chairman, secretary, and treasurer—all honorary officers—and makes its own rules of organization. Uniform rules governing procedure in ethical matters are in operation in every Division.

The main duties of the Division are: (1) To promote by meetings and other means professional collaboration and social relationships among its members; (2) to afford opportunities for the discussion of scientific matters; (3) to assist its members in maintaining a standard of ethics worthy of the profession; (4) to maintain locally the interests of the profession and to represent the profession in its relations with local authorities and other public bodies; (5) to make reports to the Central Council. Each Division appoints an Executive Committee to conduct its business, and an Ethical Committee. Other committees may be appointed to deal with particular subjects; most Divisions also have a Public Relations Committee with a public relations secretary.

At the time of the Annual Meeting of the Association a Conference of Honorary Secretaries is held to give Division and Branch secretaries an opportunity of exchanging views and making suggestions for the improvement of the Association's local machinery.

The Branch

Divisions are grouped in Branches for certain administrative purposes, which include the election of new members, the provision of funds for the Divisions, the management of those interests of Divisions which have become unorganized or inactive, and the arrangement of periodical scientific and social meetings for the members of all the Divisions in the area. A president, secretary, and treasurer are elected, and the executive work of the Branch is undertaken by a Branch Council composed of the Branch officers, members of the Central Council who represent the Branch or are resident in the Branch area, members elected by the respective Divisions of the Branch, a Public Health Service member or members, and representatives of the Local Medical and Panel Committees and of other local medical societies at the discretion of the Branch. The Branch Council appoints an Ethical Committee and such other committees as it desires.

The Representative Body

Except for certain matters relating to company law for which a general meeting of members is required, the governing body of the Association is the Representative Body, which meets once a year and may be convened as a Special Representative Meeting at other times. The Representative Body is composed of Representatives elected by constituencies made up of Divisions or groups of Divisions, members of Council for the time being in office or elected to take office, four representatives elected by Public Health Service members of the Association, and the Chairman and Immediate Past-Chairman of the Representative Body *ex officio*. It determines the policy of the Association and deals with questions of alteration of the Articles and By-laws. It considers the Annual Report of the Council, the annual financial statement, and motions submitted by the Divisions and Branches. Any resolution of the Representative Body relating to the policy of the Association in matters affecting the honour or interests of the profession or of the Association must, if the resolution is to rank as a decision of the Association, be carried by a majority of not less than two-thirds of the votes given. At least two months' notice in the *Journal* is required for motions proposing material alteration of, or addition to, the constitution or policy of the Association which are brought by Divisions or Branches before an Annual Representative Meeting, or a fortnight's notice if brought before a Special Representative Meeting.

The Representative Body elects the President of the Association, the Chairman and Deputy Chairman of the Representative Body, the Treasurer, 12 members of Council in grouped constituencies, 8 members of Council (elected by the Representative Meeting as a whole), and certain members of Standing Committees.

The Council

The Council is the central executive of the Association. It is responsible for the management of the affairs of the Association, including the *Journal*, subject to the decisions of Representative Meetings. Matters come before the Council on instructions from Representative Meetings, in reports of Committees, as representations from Divisions and Branches, as motions by members of Council, and in questions submitted by other bodies. It presents to the Annual Representative Meeting a report of its work during the year.

The Council, which is reconstituted each year, consists of up to a maximum of 68 members made up as follows:

(*a*) 10 members *ex officio*—namely: President, Immediate Past-President, and President-Elect of the Association, Chairman, Immediate Past-Chairman, and Deputy Chairman of the Representative Body, Chairman and Past-Chairman of the Council, Treasurer and Past-Treasurer;

(*b*) 22 members elected by the members of the Branches in Great Britain and Northern Ireland grouped for the purpose:

(*c*) 9 members similarly elected by the Branches not in Great Britain or Northern Ireland;

(*d*) 12 members elected at the A.R.M. by the grouped Representatives of the constituencies in Great Britain and Northern Ireland;

(*e*) 8 members elected at the A.R.M. by the Representatives acting together;

(*f*) 4 Service members, representing respectively the Royal Naval Medical Service, R.A.M.C., Medical Branch of the Royal Air Force, and Indian Medical Service, elected by the A.R.M. as a whole;

(*g*) 2 members elected by the Public Health Service members of the Association;

(*h*) 1 woman member elected by the women members of the Association.

The Council elects its own Chairman. It normally holds four meetings a year, and, in addition, two during the Annual Meeting of the Association.

Central Committees

Central committees are appointed by the Representative Body, by the Council, or by the two bodies jointly. Certain standing committees are appointed and constituted by by-law—e.g., General Practice, Special Practice, Hospitals, Insurance Acts, Public Health, Ethical. Most of the standing committees appoint subcommittees. Other special committees are appointed from time to

mentioned above; several of my patients have been followed up for over ten years with no further advance of the disease. The value of *x* rays in the benign prostatic field is nearly as great as in the similarly too-little-used field of uterine fibroids. Much of the early bladder trouble is due to spasm or congestion ("edema"—Barringer); these are usually quickly allayed by *x*-ray treatment and operation avoided. All early prostate cases might well have a suitable course of *x*-ray treatment; for in a considerable percentage this would be found to be a prophylactic against further troubles. Pituitary irradiation might help some cases (as in uterine fibroids).

An Eyeless Needle

Dr. WRIGHT LAMBERT (Keighley) writes: In reply to Mr. J. L. Aymard's letter (July 14, p. 74) he may be interested to know that I devised a needle-holder to facilitate threading, and holding, a tubular needle such as he has been using. My description appeared in the *Lancet* of Oct. 21, 1944, p. 536. The holder can be supplied by Down Bros., London, who also supply needles of all calibres and shapes to fit the holder, which will also take an ordinary hypodermic needle.

Prolapsus Ani in a Child

Mr. F. W. M. PRATT, F.R.C.S. (London, W.1), writes: I was interested to read the list of methods of treatment for this condition given in "Any Questions?" (July 21, p. 105). It is really time that most of these methods were forgotten or banished from textbooks. For instance, nothing could be more ineffectual or productive of hysteria in both parent and child than to order defaecation in the lying position. As the writer says, many cases undergo spontaneous cure and need no treatment, but there are also many cases which are persistent and should be given active treatment. I do not think that a psychological state is a common factor; diarrhoea certainly is. The following method of treatment is most effective. Under vinesthene anaesthesia 0.25 to 0.5 c.cm. of absolute alcohol is injected into each quadrant of the anal submucosa through a proctoscope, as in the injection treatment of haemorrhoids. No preliminary enemata or wash-outs are given. I have used this method for about the last eight years, and in nearly every case have had an instantaneous cure. In a very few cases this injection has had to be repeated on one other occasion.

Fox-Fordyce Disease

Dr. JOHN T. INGRAM (Leeds) writes: In my experience Fox-Fordyce disease (Aug. 4, p. 171) is responsive to oestrogen therapy, and responsive to this only.

Visiting at Children's Hospitals

Dr. L. A. PARRY (Hove) writes: A children's hospital is examining the desirability of allowing a daily visit to their children instead of, as at present, twice a week. I shall be very grateful if any children's hospital which has adopted the daily-visit system will give me information as to how it is working, especially in connexion with the incidence of infection, and the psychological effects on the children.

Adder-bites

Dr. T. V. COOPER (Dorchester) writes: In the *Journal* of July 7 there is a question and answer dealing with adder-bites. The answer advises the use of antivenomous serum subcutaneously. Why did not the adviser advocate serum intravenously? Adder-bites are not uncommon in this area. Among Service personnel I have heard of as many as three cases in one day during manœuvres on heath land. At the time of which I speak serum was not available, but I never heard of a fatal issue. Serum is now available on a small scale (see *B.M.J.*, Aug. 4, p. 172). I make a practice of holding a small stock. Under refrigerator conditions I regard, perhaps wrongly, this serum as being potent for use for at least 4 to 5 years, not the one year mentioned in the answer. The Pasteur Institute, who make the serum, give a keeping period exceeding four years. Within the past few weeks I saw an airman home on leave who received an adder-bite while out shooting rabbits, in which a delay of about two hours occurred before he was brought to the hospital; 10 c.cm. of serum intravenously when seen and a further 10 c.cm. four hours later appeared to cut short the systemic symptoms, and he was well enough to go about in four days.

*** Our adviser replies: Calmette in his authoritative work on venoms (1908, p. 263) recommends that the antiserum against snake-bite should be injected into the subcutaneous tissue of the abdomen; on page 265 he remarks: "In cases in which phenomena of serious intoxication have already appeared, and when asphyxia threatens, one must not hesitate to inject 10 or even 20 c.cm. of serum directly into a vein." So there is authority for intravenous injection in urgent cases. As regards the length of time during which the serum remains potent, I gave one year as a conservative figure.—ED., *B.M.J.*

"Doctor" or "Medical Practitioner"?

Dr. C. R. MOORE (Bray) writes: The restrictions on the use of the term "nurse" reported in the *Journal* of July 28 (p. 130) make one wonder how long it will remain customary to use the term "doctor" to connote registered medical practitioner. The latter description satisfies most of us, and it seems hardly in keeping with the dignity and ethics of the profession to be inaccurate.

Active Practice of Medical Women

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